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Vol. XV GRAND RAPIDS, MICHIGAN, JUNE, 1916 No. 6

Original Articles

THE USE OF CHLOROFORM AS AN OBSTETRICAL ANALGESIC.

W. H. MORLEY, M.D.
DETROIT, MICH.

The mother of a patient of mine, who was herself the mother of twelve children, said to me, while her daughter was in the first stage of her first labor, that the pains of labor were the hardest to bear and the soonest forgotten. This philosophical multiparous mother also made the statement that she did not mind the severity of the pains, provided that she knew they were doing some good and hastening the delivery of the child. She also said, that she had noticed when present at the lying-in of another that those who made the most fuss had the least pain, measured by what she termed the length of the birth.

These aphorisms from one who spoke from experience, both subjectively and objectively, naturally lead to a consideration of pain as a surgical entity. Any pain, to be considered a cause for medical or surgical interference, must be so severe that it causes a disturbance of the circulation and produces surgical shock. During the first stage, the pains of labor may cause much inconvenience, may make the labor tedious, but they do not cause shock. Many times, a few simple procedures like a high enema, emptying the bladder, etc. will often do a great deal to lessen the unpleasant pains of the first stage. A quiet darkened room will help in bringing this about. Rarely if ever is any medication indicated. Of course it is admitted that pain affects different individuals differently and in some rare instances an ampoule of pantopon or opium, never morphine, may be necessary to produce quiet in a highly nervous patient. An hypodermic of sterile water has been known to produce excellent results.

A word might be said here parenthetically about pantopon, that it is an excellent medicament in that it lessens the sensitiveness to the labor pains without interfering with the strength of the uterine contractions.

A cursory review of the literature for the last fifteen years, anent the use of chloroform as an obstetrical anesthetic and analgesic, illicts the surprising fact that chloroform, while easy to take, easy to administer, and with few or no after effects, may cause poisoning and destruction of tissue. This has lead to numerous erroneous ideas about chloroform and its use in obstetrics, even though most, if not all of the cases of late chloroform poisoning, have occurred in surgical and not in obstetrical cases, so that for a long time chloroform has been a *non persona grata* among obstetricians.

Many experiments have been made by many different research workers upon the action of chloroform on the various tissues of the animal body. It might not be uninteresting to review some of these experiments, more or less at length and see how these different workers arrived at their conclusions.

Bevan and Favill, after an extensive review of the literature, report a death from chloroform narcosis in which the postmortem findings showed an advanced fatty degeneration of the liver lobules, with congestion of the lungs and spleen. The amount of chloroform given was not stated except that it took a large (?) amount to obtain anesthesia, and the operation which was an appendectomy and a left salpingo-oöphorectomy for a diseased appendix and a gangrenous left tube and ovary, in a child of 13½ years, was not long, although the exact time was not stated. These authors review the work of Offergeld, who performed numerous experiments with chloroform, ether, etc., upon rabbits and guinea-pigs. The author reached the conclusion that anesthesia with chloroform, produced tissue changes in the lungs, kidneys and liver, if animals were chloroformed for a long time. The amount of chloroform and the duration of the experiment were not stated. In one series of experiments, Offer-

geld found that in pregnant animals, the pregnancy *per se* did not favor fatty degeneration but that pregnancy, complicated with kidney lesions did. In his experiments with ether, he found that his animals died, even after thirty to sixty minute anesthesias, of pneumonia. And while Offergeld found the most marked change at death in the liver, he concludes that death was due to the production of a nephrolysin resulting from the effect of chloroform on the kidney cells. Another author reviewed by Bevan and Favill was Benno Müller. This research worker came to the conclusions, after experimenting upon fifty animals, that anesthesia with chloroform, chloral hydrate, bromethyl and chlorethyl, ether and mixtures of these, always produce changes in the internal organs, which appear as beginning fatty changes. Further, that pneumonia occurs frequently after ether and ether mixtures; because of a possible pneumonia after a first ether anesthesia, one should choose chloroform for a second. Also that these fatty changes usually disappear shortly after the anesthesia.

Bevan and Favill, after a careful study of their own case of chloroform poisoning and those of both ether and chloroform reported by others in the literature, say in conclusion that we are, at present, practically limited to chloroform and ether as general anesthetics. Each has its danger; each its special field in which one is safer than the other. We have as a rule, heretofore, employed chloroform, in cases in which there was a previous lung or kidney lesion, and in children, with the idea that it was less likely to produce nephritis and pneumonia, and have used ether in the bulk of our cases and felt that it was specially to be selected in heart lesions. But a new condition of hepatic insufficiency, one that favors the development of the late poisonous effects of chloroform, must be reckoned with. Either patients must be carefully examined for this hepatic insufficiency or some new less dangerous anesthetic must be discovered, which will not produce this marked poisonous sequela.

Several authors and research workers such as Gideon Wells, Howland, Whipple and Sperry, Mosiman, Opie, and Graham in this country and Kurdinowski, Roith, Hildebrandt and Fischer in Europe, have carried out exhaustive experiments on animals with chloroform and ether but mainly with the former. They have been able to show that given in large amounts and in great concentration, chloroform was able to produce the classical liver lesions, namely fatty degeneration of the central lobule of the liver, as well as congestion and parenchymatous tissue changes of other organs.

Time will not permit an exhaustive analysis of all their reports but mayhap one or two will suffice to bring out the keynote of this discussion and that is, *that chloroform given in a proper manner, by a proper method, by a trained anesthetist is both a safe and sane obstetrical analgesic.*

Before returning to a discussion of some of the reports of these authors, mentioned above, a few words upon anesthesia and analgesia may not be out of place. While I know that I may meet with some strong opposition in my contention of chloroform as an ideal anesthetic and while I may grant you have some slight reason for your argument, I will state emphatically and without retraction, that chloroform properly used is a safe and sane obstetrical analgesia. It all hinges on the difference between anesthesia and analgesia. The former means loss of feeling or sensation, especially loss of tactile sensibility, though the term is used for loss of any of the other senses, while analgesia denotes absence of sensibility to pain. The difference is one of degree perhaps and not of kind. Bearing this difference in mind when chloroform is given to produce obstetrical analgesia, to take the sharp edge off the labor pain, as it were, and usually a few drops suffice, the poisonous after effects never ensue. Some one has said that the practice of medicine would lose the hub of the wheel, if opium and its derivatives were taken away. The same would apply to obstetrics if chloroform were to be discarded.

As to some of the reports of the research workers on the late poisonous effects of chloroform upon animals, let us examine for a moment the work of Whipple and Sperry, who report on "Chloroform Poisoning, Liver Necrosis and Repair." These authors used dogs almost exclusively in their experiments and were able to show that narcosis for any considerable length of time with chloroform, causes central necrosis of the liver in animals (dogs); if extreme will cause death. Repair of the injured lobule may take place and the lobule restored in from two to three weeks. The amount of necrosis varies directly with the length and depth of the anesthesia and the amount of chloroform used. The analysis of one or two experiments, will show more clearly this fact. A dog weighing fourteen pounds (224 oz.) was given 2.25 oz. chloroform for four hours. The amount of chloroform was 1/100 of the body weight. In this same proportion, if an obstetrical patient, weighing 150 pounds were

given chloroform in the same proportion of her body weight, she would receive one and one-half pounds of chloroform in four hours or in the same period of time. She would no doubt have late chloroform poisoning, if she could be made to live that long. Another animal, a pregnant bitch, weighing thirty-eight pounds (608 oz.) received two ounces of chloroform or 1/304 of its body weight in three and one-half hours. A patient in labor weighing 151 pounds would receive in the same length of time 0.5 pounds or eight ounces in three and one-half hours. She might have some liver disturbance later.

How the chloroform was given, except by inhalation was not stated in a description of these experiments, but it proves that long continued deep anesthesia with chloroform will cause trouble. One fact must not be lost sight of and that is that chloroform, ether, etc. are poisonous when given in too large and too concentric doses, just as morphine and strychnine are, if they were given in one or two grain doses.

Lengemann worked on dogs with chloroform and arrived at this result. He was unable to produce delayed chloroform poisoning in dogs by repeating inhalations, when the amount of chloroform was measured and just enough given to produce anesthesia and no more. In other words he did not slug his animals with chloroform but gave just enough to produce anesthesia.

As to the use of chloroform in my own experience, covering several hundred cases, my method is as follows: When called to see a patient in the first stage of labor, an attempt is made to make the patient comfortable. The usual preliminaries, such as plain enema, disinfection of the external genitalia, clipping of the pubic hair etc. are of course carried out. External examination to locate the presentation, position and the presenting part is made. The location, rate and quality of the fetal heart is determined. The patient is urged, if a primipara, to remain up and around in a semidarkened room. All unnecessary noise prohibited and the members of the family impressed with the idea that the patient must be kept quiet and not disturbed. Should the pains increase in volume and frequency as time goes on, the patient may or may not take to her bed, as a rule a little reassurance that every pain is helping just that much more is all that is necessary. If the first stage becomes long and tedious for the patient an hypo of pantopon or even of sterile water will do a great deal in making her more comfortable. When by a vaginal examination, it is illicited, that dilitation of the cervix is complete, the chloroform may be started by the drop method.

The proper method of giving chloroform to produce analgesia, and on this hinges the success or failure of its after effects, is as follows: An Esmarch inhalor is covered with two or three layers of gauze, sewed on if desired. The patient's face is smeared well with sterile vaselin and two or three drops of chloroform well mixed with air, allowed to fall on the mask from at least eighteen to twenty inches from the mask. Do not hold the chloroform container close to the mask under any circumstances, because then the patient gets the drug in a concentrated form. In the earlier stages of its administration, the chloroform is given by myself and its administration continued until just before the completion of the second stage or until my services are needed to protect the perineum, when the administration is turned over to a trained anesthetist or one who will give it under my direction. The points to be remembered are that first, only a few drops are needed at the beginning of a pain, and second, that these few drops must fall on the mask from the container at least eighteen to twenty inches from it so that each drop in its descent will mix with air, and so that when it strikes the mask, it will spread out over the mask. These two points are the *sine qua non* of the successful administration of chloroform in producing obstetrical analgesia. Of course it is needless to add that a pure uncontaminated product from a reliable drug house is also important.

When the head or presenting part of the child is about to slide over the perineum, a little more chloroform, administered in the same manner, may be given and the head or the part presenting, delivered between pains. Should a tear in the perineum occur, a few more drops given with the same precision will allow the introduction of the necessary stitches, which may be tied later after delivery of the placenta.

In conclusion I can only repeat and I wish I might write them out in letters of fire, what was said above, that chloroform, given in the proper way, by a proper method, by a not necessarily trained anesthetist, because the method is a simple non-intricate one, is a safe and sane way of producing obstetrical analgesia.

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ETHER IN OBSTETRICS.

FOSTER S. KELLOGG, M.D.
BOSTON, MASS.

The history of ether in obstetric is interesting. Dr. Charles M. Green, at present Professor of Gynecology and Obstetrics, Emeritus, Harvard Medical School, has told me certain facts from his earlier experience and that of his predecessors which carry back to its historical beginnings with a personal note. In addition he kindly placed at my disposal his obstetrical library containing many old volumes in which may be traced the changing view point on the subject in the last sixty-eight years.

Ether was first used in obstetrics by Simpson in Edinburg Jan. 19, 1847 for a version. He concludes "that though the physical suffering could be annulled by the employment of ether inhalation the uterine contractions were not interfered with." April 7, 1847 N. C. Keep, M.D. administered ether in labor for the first time in America in Boston. In Boston, 1848, Prof. Walter Channing published "A Treatise in Etherization in Child-Birth." In 1849 Dr. Warren at the Massachusetts Hospital announced that on ether-vapor concentration depended its absorption.

With Simpson's case the medical world went to war, a war in methods and expression strikingly like our present war between pro and antagonists of "twilight-sleep;" and if we may believe the claims of Ramsbothem, Dean of London Obstetrics, a violent anti writing in 1850, the newspapers and periodicals of that day were as gladly radical and free from obstetrical judgment as certain conservative gentlemen consider them today. Ramsbothem in his "System of Obstetrics" second edition edited in the United States by Keating in 1855 (though this chapter was written earlier) settles the subject of ether and chloroform in childbirth, kills it, and buries it beneath an avalanche of seeming reason. Anesthesia in obstetrics didn't appeal to him. His experience was limited, it is true, and he proved in a way satisfactory to an author sympathetic with himself that sudden death, puerperal fever, mania, and hemiplegia, fits, peritonitis, and dropsy, in fact all ante and postpartum complications, were due to its use. His conclusion was that it was a low thing, only a sodden drunkenness, and that one who administered it to a high-bred lady cheapened the modesty and virtue of an English woman. Such was his conscientious reply to Professor Simpson's efforts to show the way. Simpson's rejoinder was simply and pointedly that he had noticed nothing good came except from London. Dr. Ramsbothem's opinion of its safety may be summarized in his only indication: "A transverse with ruptured membranes of some hours' standing who refuses operation, I should deem it my duty to deliver, and in the absence of sufficient attendants to permit me to work efficiently would use a narcotic." Yet a few years later writing a foot note for the same edition he hedges just a shade. Keating, the American Editor of the same edition takes occasion to disagree with the author's "most powerful and eloquent philippic" against anesthesia, also with his countrymen Meigs and Hodge, and admits ether for operation deliveries, especially versions.

Bedford of New York writing just prior to 1862 points out that narcosis in childbirth had been abused in that "one idea has seemed to prevail, i. e., the accomplishment of childbirth without pain." He concludes: "With such an unrestricted and indiscriminate employment of these agents two consequences were inevitable. viz. their abuse and to a degree loss of confidence in their virtues." His indication for anesthetics is for operations and cases of prolonged and excessively painful labor especially in connection with rigid os. He used it when in his judgment the patient was getting too tired, especially at the end of the first stage, and having rested his patient with ether, took it away and let the patient deliver herself if possible. Even when he did version under ether he warns that the anesthetic must be removed when the feet are at the vulva so that the woman's voluntary efforts may help complete the

birth. Of ether in ordinary labors he says: "Labor is a natural function and so long as normal it should not be interfered with." Further "The female, at the most interesting period of her life—the time of labor, should, all other things being equal, have her mind unclouded, her interest undisturbed, her judgment fully adequate to realize and appreciate the advent of a new and important era in her existence—the birth of her child."

At the beginning of Professor Green's obstetrical career he tells me a strong reaction against the use of ether in obstetrics had taken place; his teachers warned against much ether, the especial fear then being postpartum hemorrhage. Prior to this, enthusiasts had used ether in confinement many hours, even twelve or more, frequently to full surgical anesthesia part of the time, causing many unnecessary operative deliveries; and he tells me of one patient of his in the country who, having sent him word that she was in labor, etherized herself as fully as possible and each time she waked took more. On his arrival all pains had ceased and she did not take in labor for two days.

Lusk of New York, fourth edition 1892, says "In my own experience during the last sixteen years there have been comparatively few cases in which I have not used chloroform or ether in some stage. The result of my experience has been to make me a warm advocate of its wider employment on the one hand, while proclaiming the necessity of caution in its use upon the other." He urges that the proper administration is an art, though a simple one, and that it should be mastered by the practitioner.

Williams second edition 1908, speaking of chloroform which he prefers to ether, says "The choice of time is of great importance, nor should it be used before the latter part of the second stage when the head becomes visible at the vulva or at least until the perineum begins to bulge."

De Lee (1913) who favors ether after a large experience with chloroform, takes a broader view but confines the use of ether in a large measure to the second stage and operation deliveries.

This brief and familiar history of our subject shows progressively a general growth in the use of obstetrical narcosis. We are now facing a fairly large public demand for painless babies, a well organized and advertised attempt to change the old order of birth. A question of importance is, shall we meet or oppose this demand? I am for meeting it as far as is wise. It seems fair then that an attempt should be made to justify obstetrical anesthesia for the sole object of abolishing pain before the major part of this paper and symposium can have much point. This question is frequently met with quibble and the issue not faced squarely.

Everyone agrees that as a rule obstetrical operating requires anesthesia. The majority of good obstetricians go on the basis, at least theoretically, that their patients shall get along with as little additional anesthesia as possible; men differ temperamentally about this.. The cry of the magazine-mothers for painless childbirth, as unintelligent a cry as that of the advertised baby for a favorite soothing syrup, should not be allowed to influence the judgment of men who seek results.

But it has been pointed out in the past, especially by Reynolds and Newell, that a certain fairly common type of American women, overeducated and high strung, stands labor pain poorly and operation well, and even if many will not allow their remedy of primary Caesarean section for such women, all will, I think, admit they exist and believe they do better with as little labor pain as possible. We are familiar with nervous wrecks dating from childbirth, in which close examination reveals no pathological reason, and in certain of these too much pain superimposed on defective nervous resistance is the cause. These cases have usually been "banged through," a prolonged labor at the hands of a general man; as a rule they would have been better "sized-up" by a trained obstetrician and etherized. They hate the thought of another pregnancy and the fear of it leads to a distorted sex view point and sometimes domestic trouble. They are frequently women of courage but are supersensitive to pain. They tell their pregnant friend and she goes through her time with the story on her mind and it unduly sensitizes her. So much for this not so rare type.

I think, however, a broader application of obstetrical anesthesia is reasonable.. The application of the "home rule"—"what would one do in the case of his own family"—applied to obstetrical questions I believe should be applied to this question of anesthesia in labor, and when it is I think the obstetrician's motto on the subject will be not "as little as possible" but "as much as is safe." I say obstetrician in this connection because obstetrical anesthesia presupposes a trained attendant present, the responsible man, or his responsible assistant.

How many men suffering the severe cramps of a questionable appendix would refuse the slight narcotic that will somewhat deaden pain but not mask the symptoms. It appears to me that many men have regarded this matter of childbirth pain with the sublime serenity of the sure-to-be-unafflicted. I see no reason why, because a woman can stand pain she should have to if it can be safely abolished. Because labor pain is soon forgotten, as is so often said, makes it none the less real at the time. All pain is soon forgotten, but it has long been held that to relieve suffering is as much a part of the physician's duty as to hasten cure.

I think it should be possible to say honestly to any patient presenting herself in the early months of pregnancy, with the fear of labor in the background of her mind, and it usually is in her mind, "unless there is some reason why it will jeopardize the life of your baby you can have your pains relieved whenever you have had enough. You may now dismiss this matter from your mind."

Having thus attempted to justify the use of ether in obstetrics at any stage when safe I will proceed with the technic of its use. For purposes of discussion pregnancy and labor may be divided into four periods in which ether may be used. 1. Ether examination in pregnancy. 2. First stage. 3. Second stage. 4. Repair stage.

1. *Ether Examination.* It has been our custom if a careful examination of the pelvis becomes necessary in pregnancy to give ether as in pelvic tumors complicating pregnancy, retroverted pregnant uterus which cannot be replaced without anesthetic. The commoner necessity for this occurs in the last month of pregnancy, in border line cases, in primipara with high heads, and multipara with a disastrous history in previous labors or with unusually large babies. The ether examination in these cases takes place as late in the last month as is considered safe before labor starts, because in occasional instances labor has begun immediately following the examination due perhaps to the examination or the etherization with subsequent vomiting, or both. If the head cannot at this time, be put into the pelvis the question of elective Caesarean or test of labor is considered and tentatively settled, and arrangements made accordingly. At this examination it is possible to more accurately measure the pelvis, and to note any boney pelvic abnormalities, and the character of the pelvic musculature and the probable degree of relaxation, easier than without ether; and to estimate far more accurately the relation of the head to the pelvis, and to note more surely the presence or absence of overriding. Full surgical anesthesia is necessary to get the proper degree of relaxation. If labor is started by the procedure, which is rare, it is in a case in which a small baby is desirable, so aside from the discomfort of taking and coming out of ether the procedure is not objectionable. If it is late in the last month and Caesarean seems inevitable, and the operator believes in doing Caesareans before labor begins, he can operate immediately, all things having been previously prepared, saving the patient an extra etherization.

2. *First Stage.* Ether in the first stage is not advised or used by most men. We give preference to single subcutaneous, one-fourth or one-sixth grain morphia toward the end when the pain is very severe. This is a wise form of anesthesia at this time, especially when the patient is getting tired with nagging pains which are not finishing the dilatation; it will frequently allow two or three hours' rest, after which the uterus often starts to work more effectively; this is especially true with cases of early ruptured membranes. In these cases careful watch must be kept on the lower segment for ring formation, the change in character of the pains due to the morphia frequently raising a suspicion of this which further investigation disproves. It is, however, frequently possible to give obstetrical ether enough to relieve pain even during the first stage without slowing up labor appreciably; the only way to tell is to try it; it must be remembered that it is not fair to use it freely enough to stop dilatation, that to force by ether an operation through a not fully dilated cervix is not justifiable merely to relieve pain. If on trial it appears, as it often will, that the ether does not slow up the pains it is allowable to use it in the first stage.

3. *Second Stage and Delivery.* In the second stage ether given obstetrically with each pain should be routine in normal cases. The average patient of intelligence and sensitiveness will work better with the top off the pains. It is frequently possible to produce a sense of exhilaration that persists between pains, and many primiparae and most multiparae will deliver themselves under ether so administered. During the delivery, assuming a normal delivery, ether invariably should be pushed to light surgical anesthesia when the chin can be checked and held behind the anus. By abolishing twisting and the voluntary straining efforts it is possible by carefully shelling the head out

to save the perineum and preserve asepsis far better than if the baby is taken "on the wing." Immediately the head is born ether should be removed. For the repair, if any, we use it again. We do not as a rule lay sutures with the patient conscious; if they are placed before the placenta is delivered it can usually be done on the end of the anesthetic of delivery time.

Unless used to giving obstetrical ether and of enough experience to determine its effect on the pains it should never be given in the first stage and its use in the second should be confined to that portion of the labor when delivery is certain.

There are three methods of giving obstetrical ether in vogue: The first is based on the idea of giving as little as possible and getting as much result as possible by the use of its and the physician's suggestion; if this does not take and the patient still notes pain well and good, she must have her pain to have her baby. It is unfortunate for her she is not more suggestable. Its success depends on the theory that if you make a woman think she has what she wants its the same as though she had it. The effect produced by the ether in this way is due to its smell and the technic consists in letting the patient have enough to smell and no more. The rest depends on the personalities of the patient and physician. My objection to this method is that it doesn't work for me. A second method of using ether consists in well etherizing the patient and then letting her come out to a point where pains begin and then holding her there with ether in the pains.. My objections to this method are first, that it stops the pains and so takes a considerable length of time to determine the effect of the obstetrical ether on the pains. Second, that a patient once surgically etherized for a time in the midst of labor generally works poorly afterwards. Third, that the patient is apt to vomit and is apt to go into an excitement stage and be difficult to control when the ether is lengthened. Fourth, that because of the above objections its applicability is distinctly limited to the end of the second stage with the head in the perineum.

The third method is an attempt with ether to abolish as much of each pain as possible without slowing up labor appreciably. I believe it is the correct way to use ether in obstetrics and shall therefore dwell on the technic at some length. To describe exactly how to give good obstetrical ether is not easy because with any special form of anesthesia, experience alone perfects. One modern text book description is to put fifteen drops of ether into an inhaler or on gauze and tell the patient to inhale it at the beginning of the pain. If ether is so administered it adds another to the reasons why chloroform is used in obstetrics. Fifteen drops of ether if on an open gauze, with the patient having no more definite instructions than to breath in at the beginning of pain, must produce a mild degree of narcosis—so mild as to place it in what I spoke of as the first or imaginary method. I grew up on drop ether on open gauze in gynecological etherizing and have tried it out extensively in obstetrics and can say unhesitatingly that it has no place in it. The closed cone, preferably made with a fresh towel well fitted to that individual's face, is the proper choice for obstetrical etherizing. A small amount—the fifteen drops if you like—of ether should be poured into it and the patient and her mucous membranes slowly accustomed to it with a few pains without attempting to produce the ultimate degree of narcosis. She is also shown how to take deep and rapid breaths as one demonstrates to a phthisis patient how best to breathe for auscultation. She should then be asked to raise a finger at the beginning of each pain, or the nurse's hand may be kept on the uterus. The cone is then well moistened with ether perhaps one-half ounce to begin with, and the patient is told to take six, seven or eight deep breaths depending on the length of the pain, as rapidly as possible as the pain begins. As the pain and deep breathing begin the cone is put rapidly to the face and held firmly there, excluding side air, through the first part of the pain. It takes about thirty seconds to take eight deep breaths as rapidly as possible. Labor pains last from thirty to ninety seconds. "The contraction is well under way before the patient feels the pain and continues a short time after the pain is gone. The educated hand laid on the abdomen can discover this point." (De Lee p. 131). In these thirty seconds breathing concentrated ether, which the patient does not fight because she soon finds it helps, it is hoped and it very frequently happens that the analgesic effect of so-called "primary ether" is obtained. The cone is removed then at about the acme of the pain, and as the pain fades analgesia fades and consciousness returns, ideally together. The method may be summarized as an attempt to give successive "primary ethers." The times given are of course not measured and vary with the individual case. I have merely attempted to analyze the procedure for each pain. This and nothing more constitutes first stage ether, and

second stage when the uterus is working well and the patient bearing down naturally; this bearing down of course in itself acts as a barrier against excessive ether inhalation because with inspiration held no more anesthetic gets to the patient. On the other hand when working and coaching a patient, especially the untrained primipara who is shirking a bit, it is well to count, as, breathe one, two, three, four, five, six. Shut the lips, bear down, now again, keep at it, now the pain is going, good, and ether off, keep pushing. In this instance the breathing should be somewhat shallower and more rapid. When the chin can be caught behind the anus and held the obstetrician signifies this condition to his etherizer and light but full surgical anesthesia with relaxation and abolition of voluntary efforts produced, the head is then shelled out leisurely, taking whatever time is necessary to preserve the perineum; immediately the head is born ether is removed, this is extremely important because the uterus is certainly relaxed under surgical anesthesia, the rest of the child is delivered either with the following pains or by careful traction if these are wanting, the perineal sutures laid and snapped. By the time the placenta is ready to come away the patient is able to answer questions, the sutures are gently tied and the patient turned in bed.

If the method has worked well, and it does as a rule, the result is a patient ready and willing to have more babies as far as labor is concerned. If it has not worked well, if the patient instead of working steadily either wholly conscious or exhilarated by understanding between pains, has become excited and uncontrollable, or if the ether has slowed the pains excessively, you have had the open choice of letting up on the ether and letting her have her pains or of pushing the ether and resorting to forceps. The choice presupposing a competent operator will depend on the factors in the case as follows: The degree of dilatation, the presentation position of the child in the pelvis, the size relation of the child's head to the pelvis, and the nervous system of the woman. You will not use ether at all with a high head if due to inlet narrowing—if the patient must mould it by. You will not push ether and operate through an undilated cervix except for definite operative indication. You will not push ether and operate on a posterior position, when rotation depends on effective pains. You will not push ether and extract a high breech that pains will mould to a low one and will perhaps deliver normally, it is especially with breeches that no chances of spoiling the contraction with ether should be taken, though here too it is fair to see if the pains will hold and the patient work better with light obstetrical ether. You will not push ether and operate early in a relatively tight bony pelvis where the safety of the child depends on a gradual moulding of the head, and where dragging an unmoulded head through with forceps will decidedly increase the risk of intercranial hemorrhage. In all these conditions you will let the mother take the pain for the sake of the child if ether works badly. On the other hand you will not let a high strung woman have a bit more pain than is absolutely necessary for the child; and I confess that I personally will push ether and operate cases with os fully dilated, head in pelvis, and transverse or anterior even if not rotated to the arch in an ample pelvis rather than let objectionable pain go on. It is here I consider pituition has its proved and safe field, and many cases under the above conditions where ether has slowed the pains, or unsuccessful obstetrical ether has made it necessary to use more may be delivered by it instead of by forceps. Try it first and operate if it does not work. I do operate these cases because I have never been able to convince myself that a careful forceps under the above mentioned conditions jeopardizes the child, and I am sure that I tear fewer perineums and the ones I do more favorably, and what is still more important preserve better asepsis with forceps under surgical anesthesia than by so-called normally delivering an unruly non-etherized patient "on the wing."

Has ether as used above any intrinsic danger to mother or child? It seems to me to have been shown that it has not; I have tried to show above when it is not indicated; there remains to consider what harm can come of it if given badly by the inexperienced; and a word regarding its use by the general practitioner.

It is very hard to kill anybody with ether, it is perhaps harder to kill a pregnant woman before the baby is born especially under the stimulation of an operative delivery. The ether deaths I have seen have been primarily drownings with mucus, they died rather from lack of air than excess of ether. Two in number, both in negroes in inexperienced hands and neither were pregnant. It is possible I believe to kill a baby in utero with too much ether without more than considerably over etherizing the mother. A very little attention on the part of the obstetrician in charge will assure that his patient is light enough to avoid this last, and that her air passages are open enough to avoid

the former misfortune. The danger in the case of the baby lies rather in assuming that some etherizer mildly experienced in surgical anesthesia is competent to etherize a prolonged and difficult operative delivery under trying circumstances, and to take the mind entirely from the patient's breathing and so permit the overetherization of the child; this of course is inexcusable but it has occurred. It is possible by badly timed and overenthusiastic obsterical ether to force patients to difficult and dangerous operative deliveries.

These remarks have special bearing on the use of ether in obstetrics in the practice of the general physician, who too often because his clientele will not recognize that obstetrics is surgery is obliged to trust his anesthetic to un- or undertrained hands, the home trained nurse, the neighbor, or the husband. It is in general practice that ether is; and I think always will be, the anesthetic of choice, it is so safe and so handy to carry. The untrained man is far safer with it than with chloroform—statistics I think will bear me out. The young medically trained man, direct from hospital or school without anesthetic experience will learn more safely on his early patients at a time when an anesthetic death may mean his ruin, with ether than with any other anesthetic; and when he passes the cone to his patient's neighbor and blissfully ignorant of forceps, as he so often is at first, starts to deliver may worry less with ether than with any other anesthetic. I have seen many first and early ethers given by second year students on our out-patient district. They were as uneven as one would expect but real trouble is very rare. Most experienced etherizers among general practitioners, especially the older ones, that I have seen, and trained nurses without special training in obstetrical etherizing, etherize patients too deeply. There is a dictum in our parts put forth by some worthy of former times that danger lies in light rather than in deep etherization. To this in obstetrics I cannot subscribe, it is the *sine qua non* of good obstetrical etherizing to have the patient deep enough to be just relaxed, but light enough to quickly regain muscle tone with the birth of the child; if one err it should be in favor of lightness. The uterus must be tonically in shape to do its third stage work, and when the placenta is out shut down and stay so. This requires constant watchfulness, one cannot get the patient breathing stertorously and then proceed to watch the operation; as a rule the eye reflex will be present throughout.. This matter is very important, much more so of course than in a surgical case, because the action of the uterus does depend on the amount of ether, overetherization is a strong contributing cause to many postpartum hemorrhages; especially of course if the operator waits so many minutes instead of so many contractions before pushing on the placenta. So too an overetherized pulse at the end of a operation is misguiding and disconcerting to the operator.

Such, in brief, is the way I had come to use ether in obstetrics and it represents with many individual variations the way it is used in my part of the country.

In conclusion let me compare it briefly with the other anesthetics in common use from my standpoint. With chloroform I have had no experience; theoretically it is too dangerous to consider in comparison with ether in general use. It has I believe its place in certain complications of pregnancy. In Boston it must always be administered by the expert anesthetist, others have no training in it. In scopolamine-morphine anesthesia my personal experience is very limited. It has been used to some extent in the institutions with which I am connected, and I think the opinion of the men using it is that it has a place in obstetrics, in certain cases, especially in patients with a truly hysterical tendency, or in otherwise very nervous women. On the whole they have noticed little danger to the child. Their associates who have not used it are strongly opposed to its use, but their opinion being wholly theoretical is of relatively little value. I refrain from commenting on the shameless advertising it has afforded certain individuals and institutions in my city beyond saying that it has merely served to prejudice competent men and retard a just estimate of its true worth. It has been used there by people not ignorant perhaps of its use but ignorant of obstetrical axioms so that their results will be fallacious both ways.

I come now to speak of the gas-oxygen-ether. It is I think the choice of obstetrical anesthetics for the specialist. I shall only say of it here that for about six months I have used it wherever possible, that it has all the advantages of ether at any stage and so far as I have been able to see none of the disadvantages of ether alone. I use the Flagg apparatus, which has the typical dentist mask covering the nose and mouth, the rebreathing bag, an ether cup attachment. It seems to have no deadening influence on pain. The patient works better with it than with ether, it is possible to examine the pelvis in the office or hospital and then send the patients im-

mediately home. In a nutshell it seems safely to give us in a majority of cases really painless childbirth.

SCOPOLAMINE-MORPHINE IN LABOR.*

A STUDY OF TWENTY-ONE CONSECUTIVE CASES.

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While the use of scopolamine and morphine in labor has extended back over a great many years, we must all admit that the first report of it's use in sufficient quantity and in sufficient detail to be of value, came from the Freiburg clinic under Kronig and Gauss.

To receive our serious consideration, any reports on the use of these drugs in labor should have been the result of their systematic employment. The occasional giving of morphine or scopolamine without either following the memory tests of Gauss or the plan of Siegel, will naturally fail, and such failures should not be ascribed to the anesthetic itself so much as to the method of employment.

If one is to pass upon the virtues of a given treatment in his own hands, he must comply in every detail with the demands made by the author of that treatment. Reports therefore from those who have used drugs in tablet form or other drugs than those specifically recommended by Kronig and Gauss should be eliminated as a judgment for or against the method of these men. The well known fact of the unstability of drugs in tablet form and especially of scopolamine, should be given recognition when considering this subject. Drugs in tablet form should, under no conditions be used in obstetrics. Only those drugs which have been put up by thoroughly reliable firms in hermetically sealed ampoules, should be employed, and before an adverse criticism should be made, the drugs from the same source as employed by the author should be used. Even then, the skill of employment on the part of the obstetrician, should be taken into account. The drugs used in the cases mentioned in this report were obtained at the pharmacy of the Freiburg clinic by the writer one year ago.

We must consider the subject in the same light as we consider any other anesthetic. The problem is that of producing a certain depth of anesthesia and maintaining it uniformly at that depth by means of hypodermic injections. The original plan of Kronig and Gauss was to determine the depth of anesthesia by memory tests, and accurate records were made in about 5,000 cases as to the amounts of the drugs which were necessary to keep a given depth of amnesia and analgesia. After this number of cases had been recorded, Siegel undertook to make a composite of these records, and he found that this composite required administration of the drugs as follows:

	Beginning 1½ c. c. Scopolamine and 1 c. c. Narcophin.
¾ hr. after.	Beginning 1½ c. c. Scopolamine
1½ hr. after.	Beginning ½ c. c. Scopolamine and ½ c. c. Narcophin.
3 hr. after.	Beginning ½ c. c. Scopolamine
4½ hr. after.	Beginning ½ c. c. Scopolamine
6 hr. after.	Beginning ½ c. c. Scopolamine and ½ c. c. Narcophin.
7½ hr. after.	Beginning ½ c. c. Scopolamine
9 hr. after.	Beginning ½ c. c. Scopolamine and ½ c. c. Narcophin.

(1 c. c. scopolamine equals 1/200 gr.)
(1 c. c. narcophin equals ⅙ gr. morphine.)

and so forth each 1½ hour, ½ c. c. of scopolamine. Every third dose of scopolamine is combined with ½ c. c. narcophin. These injections must be given sub-cutaneously.

At about the time of adopting this technic, morphine was replaced by narcophin which is about 30 per cent. morphine. These drugs were intended to hold the patient in a moderate degree of amnesia and analgesia but was not intended to be sufficient to prevent the severe pain incident to the head passing the perineum. Siegel depends upon inhalation anesthesia, usually ethyl chloride, as an adjuvant to the hypodermic drugs for this part of the labor.

The whole object of using any anesthesia in labor is to prevent or overcome pain. The writer takes the view that any method is successful if the pain has been relieved or prevented. In fact, the ideal condition is to have no loss of memory, if this can be had and at the same time can be without pain. The abolishment of pain therefore, and not of memory, should be the goal and in many cases this result can be obtained. As a rule, however, the loss of memory accompanies the abolishment of pain. If pain is abolished, the case is successful whether the memory remains or not.

The general picture of a patient under scopolamine-narcophin anesthesia, is usually quite constant. Within thirty minutes after the first injection, the pains are noticeably decreased.

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In thirty minutes after the second injection, the pain is usually abolished entirely or so slight as to be of little importance to the patient. Very few patients remember the third injection given one and one-half hours after the first. After this, the patient sleeps between pains, arouses with each pain, may turn over or cry out for thirty seconds, and then go back to sleep. If, however, one holds his hand on the uterus, he will observe that the pain really begins one-half minute before the patient cries out, and lasts about that long after she has returned to sleep, showing that only the crest of the pain wave causes any symptoms, whereas before, the actual pain lasted during the whole pain wave. A certain percentage of patients may show some delirium. Patients never remember anything that happens while in the state of even the mildest delirium.

In those cases which are well advanced in labor, and where the pains are very frequent and very violent before the injections are begun, the idea of pain is often carried in the mind of the patient and she will continue to say that she suffers intensely and that the obstetrician is doing nothing to relieve her pain as was promised. This seems so real and unlike delirium that one sometimes errs by giving too much of the drugs, hoping to give enough to relieve the alleged pain. After the labor, however, the patient invariably denies that she made any such statement and declares that she knew nothing of what was going on.

About an hour after one labor where the woman was quite talkative, and apparently conscious of the labor, the husband asked her if she suffered much, whereupon she blinked and said "I guess I must have been asleep." She did not know that the labor had been completed. Usually the sleep is so light that on being addressed, the patient awakens easily and generally replies intelligently.

If one is not careful during examinations, the pain incident to making them may be carried in the patient's mind as if it were the whole labor, and declare that she suffered during the whole time. This is proven to be untrue by the fact that she did not know of any other incident that happened during labor. In no case, has the writer found the dose as outlined by Siegel, to be excessive, but in many cases considerably less amounts will give satisfactory results. Patients sometimes will be as clear and intelligent throughout the whole labor as when normal, and yet will feel no pain. These cases are indeed dramatic.

During the past year, the writer has employed scopolamine-narcophin anesthesia in twenty-one obstetric cases. Of these, eleven were delivered at home and ten at the same hospital. As a whole, as far as the anesthesia is concerned, those in the home have done as well or better, than those in the hospital. The advantages of the hospital are solely in the facilities and extra available help which might be needed in the operative cases. The disadvantages of a hospital are that it is usually noisy, and they are usually too busy to keep a competent nurse constantly on the case. In the eleven cases delivered at home, the same assistant, one trained in the author's methods, was always present.

In all the cases, records have been made every hour from the beginning of the administration of the drug until the termination of labor. These consisted of observations concerning pulse; fetal heart tones; respiration; temperature; frequency, duration and force of pains; examinations; catheterizations; and operations; the time, kind and amount of injections and their effect as the subjective symptoms of pain; thirst; and fatigue; and the objective symptoms of sleep, color, excitation, and the influence on pains.

The ages of the patients: Seven were from 19 to 24; five from 25 to 29; four from 30 to 34; and five were from 37 to 40. Of the fourteen primipara, six were between 19 and 25; five between 29 to 33; and three were respectively 37, 40 and 42.

One primipara of 40 had a marked mitral insufficiency. One aged 42 was much below average muscular development and general strength, and was anemic. Both delivered without instruments or appreciable fatigue, and had only insignificant lacerations.

The average duration of time between first dose and delivery was 5.6 hours. An average of .047 grams of narcophin (morphine .016 or gr. ¼) and 1/100 plus of scopolamine were used.

Of the twenty-one cases, nineteen (90 per cent.) declared they had experienced birth entirely without pain, and the other two had only a slight degree of pain. There were no complete failures.

Twenty-one mothers are living and well, as are the twenty-one babies which were delivered. There were no twins.

Fifteen cases received obstetrical degree anesthesia for an average of thirty-five minutes. These ranged from five minutes to two hours. Two cases made so much disturbance when ether was started that it had to be discontinued; yet they both had painless births. No doubt

several of the others would have had a similar experience had anesthesia been withheld. Four cases received surgical degree anesthesia for forceps operations.

Thirteen cases received ½ to 2 cubic centimeters of pituitrin which overcame any tendency toward retarding of pains or lessening of efficiency, without any bad effects.

Of the four cases delivered by forceps, two were difficult medium forceps in old primipara for occiput posterior positions, and would have been forceps cases under any method. One was a low forceps in a very rigid perineum of a primipara of 37, after twenty-four hours good pains and sixteen hours under scopolamine-morphine. The fourth forceps operation was done simply to save time, in a primipara whose urine when boiled became solid with albumin. She had been under scopolamine-narcophin for eight and one-half hours before forceps were used, and the head was in the perineum.

Postpartem hemorrhage occurred but once, in a large rugged woman, para three, but was not serious.

BABIES.

Of the twenty-one babies, fourteen cried normally at birth, and with seven some mild resuscitation methods were employed. Our experience has been that these babies usually do as well to leave them alone, as to attempt resuscitation. On two cases, we tried to use an infant lungmotor, but without success, in fact in both cases, spontaneous attempts to breathe on the part of the babies, were prevented by the apparatus being over their faces. No apnea has been observed which has not also been observed to an equal or greater degree in cases where only ether or chloroform has been given. There have been no different after conditions in the babies than in other cases.

It is only fair in judging this treatment to look at the results of former methods. A study of 3,000 birth reports in Kalamazoo shows an infant death rate of 6 per cent. No doubt this is as good as the average city and should be kept in mind when judging new methods.

From experiences had in these cases, we have learned that this is a very arduous kind of work. It is adding to the obstetrical responsibilities, those of a difficult anesthetic. We do not begin ether anesthesia, and then make a call while the patient is under its influence. Similarly, we should not do so here. It is necessary that the obstetrician remain on the case constantly during the administration of the drugs and should have at his side, a trained, permanent nurse-assistant. It therefore, increases the cost per case to the obstetrician because he must refuse all other work while a cases is in progress.

The occaional delay in respiration on the part of the baby, may give the obstetrician some worry until he can judge between those which are simply apneic and those which are asphyxiated. This is the only objection which I have to offer, and this is not sufficient to condemn the method. All the asphyxias occurred in the early cases, while more narcophin was used. than later.

These disadvantages are more than offset by the advantages. Perhaps the most convincing argument in its favor is the testimony of the patients, which in every case related above is enthusiastically favorable. This opinion naturally is based mostly on the freedom from pain, but is also because they experience little or no exhaustion after labor is completed. The enforced closer, hourly observation and records are safeguards to the patient which are usually not obtained in other methods.

The compactness and portability of the drugs and hypodermic syringe is a great advantage for this method, as is the fact that it does not require a special anesthetic assistant, which in turn adds expense. The obstetrician and his specially trained nurse-assistant can conduct these cases alone and in homes if necessary. The low cost is also in its favor; the cost even in war times averaging about a dollar per case.

It worked well in one pre-eclamptic case, and theoretically should help to prevent convulsions. It is strongly indicated in cases with heart disease and impaired strength; and in nephritis should cause less damage than ether or chloroform. It is indicated in the highly sensitive woman and those who lack self control.

In judging any new procedure, we are very apt to place too much importance on events which are really accidental. During the time this group of cases has been observed and which has had no infant mortality, the writer has delivered two dead babies under the other methods. A confrere also recently delivered a normal woman without any anesthesia, of a baby apparently normal except that there was some cyanosis which persisted rather stubbornly except when resuscitation measures were employed. Next day the baby died apparently from some respiratory disturbance. A thorough postmortem was held, including detailed examination of the brain, as well as abdominal and thoracic organs. Absolutely no cause of death could be determined. No cause being found, one would naturally have charged the death up

to scopolamine-narcophin or any other unusual method, had it been employed.

Last week, Dr. X and myself were delivering respectively two primipara in the same hospital and at the same time. My own was a scopolamine-morphine one, and went ideally for both mother and babe. The case of Dr. X, where this anesthesia was not used, went badly; the pains became ineffective even under pituitrin, and after many hours' labor, a difficult high forceps was done with much injury to both mother and babe; the operation being done by myself. Now, had the cases been transposed and had I drawn the difficult case and used the twilight method, the criticism naturally, though unjustly, would have followed, that the method was to blame for the need of operation with its bad effects.

The question to answer is which method has the largest percentage of results as observed in a large series of cases. My own opinion is that there is here a freedom from lacerations due to the greater gentleness of delivery; that there is less need of forceps since by this plan the patient can continue the labor longer without exhaustion; and having painless labors, she will therefore have less worry and depression in future pregnancies, and that these more than offset the occasional detrimental condition which may be ascribed to the method.

Being safe for the mother and having no higher mortality of the baby, it really resolves itself into a problem of the *doctor* and not of the patient. I believe that in the hands of a competent obstetrician who is willing to take the time, it is a safe method.

NITROUS OXID-OXYGEN ANALGESIA IN OBSTETRICS.*

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Labor pains date back to antiquity. Eve was undoubtedly the first woman to suffer the pangs of childbirth. Yet we know from the records of primitive races that labor was usually easy and relatively free from pain. However, civilization with its artificial dress and customs has rendered woman more of a hot-house product and physically less fit to perpetuate the race. While among the women of civilized races easy labors are not rare, most women are in labor several hours, and unaided suffer considerable and often very severe pain.

Attempts to relieve the suffering of childbirth also date back to antiquity. Simpson in writing on the history of anesthetics in midwifery quotes from the Greek writers and refers to the persecution of witches who tried to abolish its pains through charms and other means. During the years since Simpson introduced ether and chloroform into obstetrical practice many drugs have been used with varying degrees of success and failure in the attempt to secure painless childbirth.

The dangers accompanying the prolonged use of ether and chloroform were early recognized, and following the recent conclusive experiments of laboratory investigators their use has been limited to the end of the second stage.

Nitrous oxid and oxygen analgesia was used by Klikowitsch in 1880 and Winckel in 1881. After using this analgesia in fifty cases Winckel said that it was much to be recommended. Later he writes: "The apparatus, which consists of a rubber bag like a pillow, is inconvenient, it must be confessed, but this is subordinate; in abnormally painful labors it is at any rate an extremely important remedy." Owing to its cost, the crudeness of the apparatus used, and the fact that it was often given to the stage of asphyxia, nitrous oxid did not come into general use at that time.

Ten years ago, Dr. J. C. Webster of Chicago began to use nitrous oxid and oxygen in operative obstetrics when ether and chloroform were contraindicated. In 1909, the writer gave the anesthetic when he performed the first cesarean section under nitrous oxid and oxygen. Its use was gradually extended to all classes of cases, but except in one or two, its use was limited to the end of the second stage as the hospital was not willing to bear the supposedly excessive cost of its prolonged administration, and we did not then appreciate its great value in abolishing the shock of labor. Arthur Guedel of Indianapolis, in 1911, advocated nitrous oxid-air analgesia during the second stage of labor, but our first knowledge of its prolonged use in America was in July, 1913, when Drs. Lynch and Hoag confined the daughter of a Mr. Clark, the maker of a gas apparatus, and the analgesia was administered for more than six hours. Dr. Lynch was very enthusiastic over the results obtained in this case and since then has used it constantly. Dr. Heaney, who began its extended use about the same time, is equally enthusiastic.

The nitrous oxid-oxygen analgesia as used in obstetrics is similar to that used extensively by dentists, but differs in that it is not continuous. For the benefit of this association I

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have attempted to outline the technic used at the Presbyterian Hospital, Chicago. This technic has been developed gradually, and is used with minor variations by the various members of the Obstetrical Staff. I believe with Dr. F. W. Lynch that a physician will best use this method after carefully testing the effects of nitrous oxid and oxygen on himself.

The first consideration in this work is the choice of a gas machine. From our experience we would make the following suggestions: 1. The apparatus should be a nitrous oxid-oxygen mixer as the use of straight nitrous oxid has marked limitation. 2. It should have some type of automatic regulators which will maintain a constant pressure in the gas bags. 3. The mixture of the gases should be controlled by a single lever or valve. 4. Portability is desirable but is secondary to usefulness.

In administering the analgesia, economy of the gases may be secured in the following ways: 1. Be certain that there is no leakage of the gas from the tops of the cylinders or from any of the connections. 2. Never more than half fill the gas bags and usually keep them about one-third distended. 3. Use the minimum number of regular deep inhalations necessary to secure the analgesia. 4. Do not anesthetize the patient. 5. Use the large cylinders of nitrous oxid and oxygen in hospital practice.

The automatic regulators on the apparatus we employ are set at a point which allows the bags to become about one-third distended when the full pressure of the gases is turned on. In case such regulators are not used the bags may be half filled between the uterine contractions. For the women who will co-operate with the physician, the nasal inhaler is useful, but for mouth breathers, hysterical women and those who will not follow instructions the face inhaler is necessary. On admission to the hospital the patient has the usual preparation for delivery. She is told that the nitrous oxid will be given just as soon as her contractions become painful. Generally the patient will not ask for the analgesia until the cervix is fairly well dilated and the uterine contractions are coming every few minutes. She is then placed on the delivery bed and taught how to breathe the gases, and if the labor is well advanced how to work. This may at times be difficult, but it is usually accomplished during a few contractions. It is advisable to have the room slightly darkened and free from all unnecessary noise and conversation. Cold compresses on the forehead covering the eyes are often soothing.

With the first suggestion of a uterine contraction the inhaler is placed in position and the gas turned on. The patient is given two deep inhalations of pure nitrous oxid; 5 per cent. oxygen is added with the third inhalation, and from 10 to 20 per cent. is given subsequently. The percentages vary greatly and must be determined for each patient. If the labor is well advanced the patient is instructed to hold her breath and bear down after the fourth or fifth inhalation. However, if it is observed that two or three inhalations will produce analgesia, she should be told to bear down as soon as analgesia is assured. She is then given another inhalation and may again bear down. The release valve is now closed to prevent further escape of the gases, but instead of removing the inhaler the lower edge is raised sufficiently to allow the breathing of air, and it is removed only at the end of the contraction. The patient is then told to lie quietly and rest until the beginning of the next contraction.

It is advisable that the physician follow the progress of the labor by means of rectal examinations. A vaginal examination is rarely necessary in a normal case. Unless the physician is alert the patient, especially if she is a multipara, may precipitate. Although the analgesia has no appreciable effect on the child the fetal heart rate should be followed with the usual care.

During the analgesia the patient holds the straps which are fastened to the foot of the bed and makes traction on them during the bearing down efforts of the second stage. When the caput appears at the vulva she is warned that she must immediately obey every instruction, and she bears down or does not at the request of the obstetrician. More nitrous oxid is often required during delivery of the head, but the patient should not become anesthetized as she will then lose her self control and may struggle as with ether.

The nurse or some member of the family may be taught to administer the analgesia for the ordinary normal obstetrical case.

Nitrous oxid and oxygen is recognized as the safest of anesthetics. Nitrous oxid can only cause death by asphyxia, and in giving the analgesia this is impossible owing to the use of oxygen and the few inhalations required. It is quickly eliminated and has no deleterious effects on the mother or child. The cost is not excessive. Using the small tanks I have in one case maintained analgesia for nearly eleven hours at a cost of six dollars.

The belief that pain is an inevitable accompaniment of labor has in the past reconciled

mothers to endure it. But they are now demanding relief and justly. The nitrous oxid-oxygen analgesia is a sane, safe and certain method of relieving the pangs of childbirth.

25 E. Washington St.

DISCUSSION

DR. BELL: It occurred to me, while sitting here, that we could here and now get a very decided answer to the old, time-honored question of whether chloroform or ether is preferable in obstetrics, and I think we will all be satisfied to have a vote on the question. We have a representative body of obstetricians in the room, and I want to ask all those who use chloroform—now I want you to be honest about it—who use chloroform in labor to hold up their hands. (Show of hands.)

I count sixty-five.

Those who use ether.

I counted twelve.

Dr. Kellogg, you see how the doctors are choosing here.

Now, that is not criticism on the administration of ether, gentlemen. In our clinic in Harper, in Detroit, we use ether exclusively. Now, why do the vast majority of men—we have a representative body here—why do they use chloroform in preference to ether? They all know—it has been demonstrated conclusively, I think—that ether is less dangerous than chloroform, and still the doctors keep on using chloroform. Why is it?

My opinion is this, chloroform is easy to give. It does not distress the patient so much, it does not produce that sense of suffocation that ether does; it is easy to give; it will not explode while you are giving it in a room where there is gas; it is not seriously dangerous, I believe. Notwithstanding what some men say about the administration of chloroform, I do not believe that it is seriously dangerous.

The vast majority of men, at least those who have graduated and are out practicing now, have been taught to give chloroform, in the Middle West, I think the majority, I think we can safely say anyway 75 per cent., and they give chloroform intelligently. They know that there is danger, of course, as there is more or less with ether, and it is easily given to the patient. The patients take it more readily than they do ether, and unless it is given for a long period of time, I do not believe it is dangerous. That is my opinion of the administration of chloroform, why it is preferred to ether.

Dr. Morley's paper I thoroughly agree with, I think, with possibly two exceptions. One statement he made, that there is no shock in the first stage of labor; that I cannot subscribe to, I believe that there is shock. The first stage of labor ends with complete dilatation of the cervix. By that time some women have suffered a lot of pain, and pain will produce shock; therefore I believe that there is some shock produced by the first stage of labor.

There is another possibility, or another point that the doctor did not discuss in his paper, and that is the question of whether or not you do not in some instances produce hemorrhagic disease in the infant by prolonged chloroform labor. That is a question, whether or not some of these little babies that on the third or fourth or fifth day start bleeding, and become more or less comatose and die of so-called hemorrhagic diseases of infants, whether or not the prolonged use of chloroform does not produce that condition in the infant.

I am sorry Dr. Kellogg did not take up the question of the destructive changes in the liver by ether. I think that Clark and his associates in Philadelphia demonstrated clearly that prolonged ether administration will produce these changes in the liver cells, so that I think that ether is not entirely without danger.

My opinion is that either of these anesthetics is safe when given properly, and for not too long a period of time. I think that is where the whole trouble is, if we give either one, chloroform or ether, for a long period of time, we are likely to have these changes in the liver which subsequently, in the puerperal stage, result disastrously to the mother, and frequently to the infant.

There is a question about the determining of the susceptibility to the toxemia produced by these anesthetics in certain women. Can we tell beforehand? I think a little light is shed along that line by Fisher with his little aniline red test of the urine. It will determine the condition which we call acidosis, which is undoubtedly very similar to that of poisoning which we find in pregnant women. I believe there ought to be a practice of testing the urine of every woman to determine whether or not they can stand any surgical anesthesia.

I have had no experience with the nitrous oxide and oxygen anesthetic, therefore can say nothing at all on that score. I have had limited experience with the *"daemmer schlaf,"* and my experience has been almost identical with that of Dr. Boys except I think he has been a little more fortunate than I have been, especially with the babies. In the fifteen cases we have had three so-called "blue babies," two quite markedly blue, bluer than I have ever seen with any other anesthetic. The babies all lived, but the condition is a peculiar one. The Germans describe it as apnoeia and try to make a distinction between it and asphyxia. The condition sometimes resembles the limited asphyxia as we see it in ordinary child birth. It is a peculiar, uncanny condition, and Kronig and Gauss tell us: "Don't worry, the baby will come around, they all recover." But I have not arrived at that stage yet where I will leave the baby alone, I want to do something to get that baby to breathe. It will cry when born in a perfectly normal way, you tie the cord, get them out of the room, in a little while the nurse comes back, "Doctor, the baby is not breathing." You go in, find the baby lying, you give it a little slap and it is not breathing, but if you open the eyes it gives a peculiar demonstration. That is my experience with three "blue babies;" the others were all right. Two of them I have actually resorted to artificial breathing, the third one breathed with the ordinary "slapping," and sprinkling with the cold water. But I must confess, I cannot lay that baby to one side and say that it will be all right.

With regard to the mothers with four out of our series of fifteen the results have been somewhat unsatisfactory, the patients were noisy and boisterous, when we started to give them ether. (We give ether in, I think, the vast majority, fully 75 per cent. of the cases, we give ether to terminate the labor, to get them soothed for the final stage.) We had

four cases that were unsatisfactory, although they afterwards, after everything was all over, they claimed they did not feel very much pain, and the mothers preferred that form of anesthesia to have the baby in any other way. They were all satisfied with their cases. I think we had about seven or eight that were absolutely ideal. They were of the nervous type that Dr. Boys spoke of, and seemed to respond to the treatment better. They went through the process just as he has described, dropped off about one-half or three-quarters of an hour, then the administration of the second dose and from that time on it was just a case of sleeping and moaning at the height of the wave of pain. In one case I was sitting at the bed, and they expected it would take half to three-quarter hour until the baby was to be born, and I noticed the patient moaned a little longer than usual, the head was bulging and the child would have been born right away if I had not taken occasion to look at that moment. In fact, in the majority of cases the women knew absolutely nothing after they had had the second injection, a few of the others remembered the time that we started the ether and that was about all.

My idea is that we do not need to stick strictly to any prescribed formula. I think the object is to get the woman to deliver the child without pain, without suffering, and we can use the *"daemmer schlaf,"* or use ether or chloroform if we have it, but it is all a matter of the individual case, and the judgment of the man who is attending. You have got to be a good obstetrician, you have got to know the indications for the drugs, and you have got to know the peculiarities of the patient, and the mechanism of labor, in other words, you have got to be a good obstetrician to get good results, that is my idea.

Dr. William Fuller: I have been practicing about fifty years, and I have attended a great many obstetrical cases. You asked about the administration of chloroform, I do always use chloroform, and always considered it perfectly safe, although I administered it in such a way that the patient was conscious most of the time, and I would ask her to take a long breath, "Now breathe quickly and inhale just when the pain is coming on," and I have kept these patients under chloroform for several hours, as well as in surgical cases, as much as at least five or six hours, and I have never seen any harm come from it. I had a large practice when I was in Montreal, and a consulting practice also, and I cannot remember either a baby or a woman dying from anything relative to the administration of chloroform, and of course I do not propose to give it up yet, unless I give up the practice of medicine.

Dr. Morley: I have not anything more to add to my paper, except that Dr. Bell spoke about shock. I did not mean to convey the idea that the patients never had shock in the first stage of labor. I simply mean to convey the idea that the pain, to be considered a surgical entity, had to produce shock. Sometimes it happens that patients are shocked in the first stage of labor, at least if that was your question, Doctor Bell. And then he spoke about hemorrhagic diseases in infants from chloroform. I remember one case that I had with a hemorrhagic disease in an infant, and that was in a patient whom I had delivered once or twice before, and at this time it was rather a precipitate labor, at least when I got there, there was just about time to get ready and put on my gloves and then take the baby, in fact, it came so fast that there was a slight tear in the perineum, which I repaired after the baby was born under chloroform, and this baby did have the hemorrhagic disease, that is, blood in the stool. That was the only case. You would not say that came from chloroform.

Dr. Kellogg: I do not believe that there is any more hemorrhagic disease under chloroform than under ether, because I think there have been, in the 28,000 cases in the lying-in hospital in Boston, some forty cases of hemorrhagic disease where there has been nothing used but ether, and I think that is well up with the statistical average. I think that as far as ether goes, and experiments of ether on patients go, and experiments on dogs go, that there is not very much relationship between it.

I think that the doctor, speaking of chloroform, has pointed out that you have got to give—going by the relative weight—you have got to give about a tub of chloroform to get the same result in the patient that you get with the dog, and I think that applies still more to ether. There has never been, in the 28,000 cases delivered in the house, in the last six years, a case of death attributed to ether but what it was demonstrated she had suffered lesions, at least that did not previously have a definite toxemic jaundice, which presumably accompanied the later lesions and from which she presumably died.

I think about ether, one reason that it has not been used in this part of the country is because most people have taken up chloroform and have liked it so well that they have not tried and they do not know how much you can do with the ether. They think that it acts slowly, and I think that the teaching of the administration of obstetrical ether is bad, because it is taught to be given almost as though it were chloroform. We have had one anasthol death, its analgesic or anesthetic effect being largely due to the chloroform. There is no question but that death came from its mal-administration. The case was started with anasthol, then shifted on to ether, then back to chloroform, then to anasthol, which I think is a notoriously bad way to give it.

Dr. Boys: I have used chloroform. I have used ether, I have used scopolamine morphine, I have used for surgical purposes nitrous oxide and oxygen for several years. It is certainly the ideal anesthetic if folks can stand the price. There is no reason why it would not be an ideal obstetrical anesthesia except that there is the question of expense, to get them under quickly and as quickly out again. It seems to me ideal. There is no question in my mind that it is a very desirable anesthetic in obstetrics. I have not used it in obstetrics, although we have used it in other cases for a number of years. It seems to me it is a cumbersome thing to carry around, although it is not necessary to have an expert anesthetist to administer it. We have always thought it required an unusual skill in an anesthetist to give nitrous oxygen. The fact is that it does not need to be so deep, which makes it safe in the hands of the lesser experienced man. The carrying of tanks of gas is not an easy thing to do. Perhaps some device may be made so that it can be carried about more easily. The question with us in obstetrics is that of cost. The cost is so great that

if we add any further to it we have to make it for the love of science. On the other hand, it may make an excuse that we can charge what we should charge. I know that is to a certain extent true in scopolamine-morphine work.

I think the advantages of chloroform are that it is handy, and, like religion and other things, it is the way we grew up. We are the victims of what we have been taught. Chloroform certainly is responsive, so far as giving is concerned, if we do not give it too deeply, naturally we will not get the bad results. The worst objection I have to chloroform is that we cannot use it in a room with light without asphyxiation of yourself and assistants and everybody in the room. I know of one case where three doctors had to retire from the room leaving a very critical case, because the chloroform was set free by open lights. With ether, on the other hand, you know you are safe; it will not explode or cause any disturbance. All you have to do is to set the light higher than the ether. The odor generated by ether, as of chloroform, passes into thin air, while some pungent odor connected with it is not distressing and need not stop any one from what they are doing.

In reference to scopolamine-morphine, the most enthusiastic people I have for it are those who have had babies. I have one who had four babies before this and every one had to be delivered with instruments. This baby was delivered normally. She said she was from Missouri and had to be shown, and she was willing to try. She was one of those nervous type of people that was exactly adapted to this form of anesthetic. The women who have had babies and know what it is are the ones that are enthusiastic over it. The primiparae have nothing to check up with and therefore they think it is just normal, that is, the result, and it is the mothers, therefore, that are the most enthusiastic in favor of this method.

Somebody asked where we get the drugs. I fortunately had sufficient to last for these cases. These drugs can be obtained by the Marcy Company, there are three firms. A drug company of Kalamazoo got them for me. That shows that they are available in this country.

One doctor asked about the condition surrounding these patients, that is as to light, noise, etc. In the Freiberg clinic they delivered four women at the same time. It is just like a nursery; they do not all have their pains synchronously, and so one is passing through pain while the other is wanting to sleep, so there is no ideal condition as to light and noise. As a rule there are five or six Americans sticking around to see what is going on in the "twilight line," so there are the nurses that are required, and there are four or five Americans besides four patients together in this same room about the size of this, all at the same time. I cannot conceive of that being a noiseless, lightless sort of room in which to conduct cases. Most of those are charity cases, and they go to that particular room. Private patients go to private rooms under more favorable conditions. I believe light wakes them up as much as noise. Of course I should like to shut noise and light off, but I believe they are minor factors in cases.

DR. DAVIS: It seems to me that the first duty of a physician in regard to an obstetrical case is to make that case just as easy for the woman as possible, and that, of course, necessitates his using the method which he has at hand. And, furthermore, if he has chloroform and nothing else, use the chloroform. If he has ether, use the ether, use the method which he can. But in using a method there are several things which he wants to take into consideration. It is the duty of every physician to do the safest thing by his patient, and before we come to decide just what we should use as an obstetrical analgesic, or as an obstetrical anesthetic, let us consider for just a minute the relative safety of the various anesthetics.

In 1909, Thatcher prepared a report on the use of scopolamine and morphine in surgery and obstetrics. In that report he says that H. C. Wood reviewed twenty-three deaths in which scopolamine and morphine had been used, and found that in at least nine of these that death must be attributed to the use of scopolamine and morphine, making a death rate of one to 215 from narcosis. Now, we will grant that, used as it is used in the "*daemmer schlaf*," that it is very much safer than that, but the fact remains that, used in surgical anesthesia, it is the most dangerous anesthetic known. Louis Frank, in a paper read at Philadelphia last fall, makes the statement that, as near as he can find from available statistics, that there is about one death to every 3,000 administrations of chloroform, whereas there is only about one death to every 30,000 administrations of ether. He quotes from the researches of Buchanan who, after investigating statistics from many sources in regard to nitrous oxygen, arrived at the conclusion that there was about one death to every 5,250,000 administrations. I quote those statistics.

I have given many hundreds of nitrous-oxide anesthetics, and—as some one made the remark in regard to the giving of such anesthesia—I know of no anesthetic that requires the amount of skill that nitrous oxygen does, and especially if you are using whole nitrous oxygen. If you use a certain given percentage of oxygen, you will very materially lessen your danger by choosing your case, using it properly and watching your patients while you are giving the anesthetics. Nitrous oxygen is undoubtedly the safest and nicest anesthetic to give. Miller, in the paper read before the American Medical Society in 1910, in the symposium on anesthetics, states that it is very difficult to get statistics regarding death rate from the various anesthetics, but, as nearly as can be determined, the death rate from nitrous oxygen anesthetic is some place between one in 100,000 and 150,000. So the fact remains that it is very much safer than any other anesthetic. Used as we use it in obstetrics, given to the point of analgesia, where the patient is never asleep, where she hears everything said, where she is perfectly conscious and able to move when you tell her to, it is impossible for death to result during the administration of this analgesic. In the case referred to, where I administered it to an obstetrical patient for nearly eleven hours, the heart beats were watched every half hour, and during that time it did not vary over five counts, which I think is a pretty good record. The mother's pulse during the entire time did not vary ten beats.

If nitrous oxide will relieve the suffering, as we know it does, if it is as much safer as the statistics would indicate, is it not the duty of a physician who

is going to practice obstetrics, to give his patient the best that can be obtained?

Dr. Morley spoke about the obstetrical fees. Why is it that obstetrical fees are so ridiculously small? Why is it that we, every one of us, will expect to get a fee of $100 for removing an appendix, and only get $25 for delivering a baby? You worry more about the baby than you do over an appendectomy. Why not the reverse? Why not charge $100 for a confinement and $25 for an appendectomy? It is much more logical. It is safer for the average man to do an appendectomy than it is for the average man to do a simple obstetrical procedure at the home, and the only reason that people do not consider it so is that because physicians have allowed them to go on and consider a labor a physiological process. Physicians are to blame for the low obstetrical fees, and the most hopeful thing in regard to the present demand arising from women for relief from pain in child birth is that women are going to awaken to the rotten condition that is prevailing over the country in regard to obstetrics. They are going to compel us to practice better, to give them the attention that we should, the attention that we give to any other surgical procedure, and they are going to be willing to pay us for our work.

THE PRACTICAL APPLICATION OF THE SCHICK REACTION.

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The Schick reaction as brought out by Schick of Vienna, Rohmer and worked out by Park of New York has proven a reliable aid in the control of diphtheria. It is a good test of immunity and is of a great value for use in institutions such as orphan asylums and foundlings homes. It is not intended to supplant the use of prophylactic doses of antitoxin but at least its use will show antitoxin unnecessary in about 50 to 75 per cent. of cases.

From a resumé of current literature on this test the practical application seems to be as follows:

(1) By its use the number of immunizing doses of antitoxin considered necessary will be reduced.

(2) Even where bacteriological findings show Klebs-Loeffler present in the throat; as in other infectious diseases, as scarlet fever, measles, etc., a negative Schick reaction renders antitoxin unnecessary.

(3) It is of value to test from time to time the immunity of all employees in diphtheria wards, as nurses, ambulance help, maids, etc.

(4) It is of value in deciding which is a clinical case, shown by a positive reaction; and which a carrier, shown by a negative reaction with an accompanying positive culture.

(5) It is a good check of the amount of antitoxin that should be given and has shown that in bad cases the use of large doses by the intravenous route are necessary.

The test depends upon the local irritant action of diphtheria toxin when injected into the skin, in the absence of a neutralizing amount of antitoxin. This seems to be proved as follows:

In a person known to give a positive reaction (a house-physician in the diphtheria ward)—the test was performed in several places in close proximity to one another; first, in the usual manner, then in the usual manner except that diphtheria antitoxin was previously mixed with the diphtheria toxin in varying proportions in a sterile container just previous to injection.

Where the test was performed as usual a positive reaction resulted—in the others where toxin-antitoxin mixtures had been used negative results followed.

The essentials for the performance of the test are:

1. A good reliable fresh diphtheria toxin. The primary dilution should be 1-10 in carbolic acid; the diluted kept on ice will keep from one to two weeks.

2. A good sharp short patino-iridium needle and an all glass syringe graduated in tenth-centimeters, a tuberculin syringe with a colored barrel works admirably.

3. A good uniform technic of performance as follows: The skin of the flexor surface of the forearm is scrubbed thoroughly with soap and water, grasp the forearm between thumb and forefinger of left hand and with a downward pull stretch the skin tightly at the same time steadying the arm and insert needle of syringe held in right hand into the layers of the skin and thus inject 0.1 cubic centimeters of the dilution, which is so made as to equal 1/50 of the minimum lethal dose for a standard 250 gm. guinea pig. (Inject upward). A good technic is shown by the appearance of a whitened bleb which shows pittings of the hair-follicles and does not disappear on withdrawal of needle.

4. The proper observations of the test at different periods in the next twenty-four to forty-eight hours. The reactions that follow the application of this test are of two types, the true and the so-called pseudo-reactions. The pseudo-reaction is at its height in twenty-four hours and disappears rapidly.

A study of this test on normal individuals of various ages shows that 80 per cent. of the newborn, 50 to 60 per cent. of children and 90 per cent. of adults have sufficient antitoxin present in their blood to resist an ordinary exposure

to the diphtheria toxin. Von Behring has calculated that 1/30 unit and sometimes even as low as 1/100 unit of antitoxin per cubic centimeter would protect against infection.

For this paper observations have been made of Schick reactions done under various conditions but with the same toxin and the same technic. It has been used to control outbreaks of diphtheria in various institutions of the city as follows:

Report of Diphtheria situation at Florence Crittendon Home.

Report of Diphtheria outbreak at the Grace Hospital.

Report of Children's Free Hospital outbreak.

From a perusal of these reports it is seen that while results were not perfect and that in an occasional instance there subsequently developed a case of diphtheria (it was usually in a borderline case and one that may have been able to care for itself), on the other hand the test proved of inestimable benefit, it rendered unnecessary the giving of antitoxin in 50 to 75 per cent. of cases. In one instance no outbreak followed two violent exposures, and in another instance where the outbreak had gained a good start and the sources of infection numerous it stopped the spread as quickly as would the immunization of all the inmates. In another instance, namely, the outbreak in the Florence Crittendon Home during December and January, it will be seen that best results are obtained where culturing of the nose and throat, and isolation of the carriers is at the same time done to prevent repeated exposures. I have seen diphtheria develop after an immunizing dose of even 3,000 units and know that it not infrequently develops after the smaller ordinary immunizing dose of 1,000 units. With the ever present danger of anaphylaxis (which I believe is very remote) there is no doubt that much serum sickness is prevented by the application of this test. Thus the number of immunizing doses of antitoxin may be reduced from 60 to 80 per cent. with apparently as good results in the control of an outbreak.

Since March 1, 1915 we have tested all cases admitted to the scarlet fever and measles wards with this reaction. Previous to this all cases were cultured and given 3,000 units on admittance. Of 270 cases treated in this manner the cultures were positive in seventy-eight cases or 29 per cent. Even so occasionally in convalescence, diphtheria would develop and further protection with antitoxin would be necessary.

Since March 1, 1915 with the application of the Schick reaction there have been admitted 323 cases. Of these thirty-nine or 12 per cent. had clinical evidence of diphtheria and were given full doses of antitoxin. Of the remaining 284 cases thirteen or 45 per cent. gave a positive reaction to the Schick test and were protected each with 3,000 units. Of these cases which were not thought necessary to immunize because of a negative Schick reaction on admittance, in two cases it was thought necessary later to further protect, one case developed nasal diphtheria in the fifth week and another nasal case occurred on the seventh day. In both these cases the disease was of a carrier type and would probably have recovered without further protection. Another case developed diphtheria in the seventh week but a Schick reaction performed at this time proved positive. This latter instance shows that susceptibility to diphtheria toxin as expressed by the Schick reaction may vary in short periods of time. But while it had been necessary heretofore to immunize every patient admitted to the scarlet fever and measles wards and even so diphtheria would frequently follow, now only 4.5 per cent. require immunization and diphtheria is much less frequent as a complication.

That it is of value in the protection of employees exposed to diphtheria patients is shown as follows: It is a good test of suspectibility to diphtheria for nurses who are about to commence duty in diphtheria wards, or for maids, or ambulance help, house-physicians, etc. In this manner we have performed the Schick test on twenty-three nurses, of these nine or 39 per cent. showed a positive result and were immunized each with 3,000 units. Of the fourteen giving a negative reaction, three later developed diphtheria, one on the third day, one on the sixteenth day and one on the twenty-fifth day, after the performance of the test. In these three instances the attacks were mild and recoveries rapid. Of the ten cases immunized, six of whom were previously Schicked and proved positive and four of whom were not Schicked, one developed diphtheria on the third day and had to be further protected, five or 50 per cent. had serum sickness which necessitated their being off duty a total of fifteen days or an average of three days each. Thus even though in a few instances a nurse subsequently developed diphtheria after a negative Schick reaction, the attack was always mild and recovery complete. The frequency of diphtheria following the application of the Schick test is therefore very little more than following general immunization and serum sicknesses, etc., are obviously much less frequent. The work

shows that if the test were performed at shorter intervals and much more frequently, results would be much better.

As an exception we have found that in some instances a positive Schick reaction results where we have every reason to believe that susceptibility to diphtheria is not present. Some of the nurses who have been employed for some time in the diphtheria pavilion, who no doubt develop an immunity to the disease, else they would more often be attacked unless frequently immunized, which is not the case, will give repeatedly a positive Schick reaction. I often perform a Schick reaction on myself and in most instances it is positive. Park concludes from this that all who show a positive Schick reaction are not necessarily susceptible to the disease. He cites an example of one of his workers who swallowed actively toxic diphtheria germs giving a positive Schick reaction and yet did not contract the disease. Hence a negative reaction means that susceptibility to diphtheria toxin is not present but a positive reaction does not necessarily show that susceptibility is always present.

It has been repeatedly shown that carriers give a negative reaction and clinical cases a positive reaction. In institutional work where the Schick test has been used, and at the same time cultures have been taken, the cases with absolutely no clinical evidence of the disease but showing Klebbs-Loeffler bacilli present, i. e., the carriers, always gave negative Schick reactions. These cases were isolated but not further protected and did not become clinical cases. Clinical cases of diphtheria have given a positive reaction. When large doses of antitoxin are given at the same time as the Schick reaction is performed the result is usually negative but may be positive. This may be explained by the using up of all antitoxic bodies by combination with the toxins absorbed from the diphtheritic process. For this series Schick reactions were performed on seventy-two cases on admittance to the diphtheria wards. Of these seventy-two cases admittance culture was positive in thirty-six cases. Therefore of these thirty-six diphtheria cases, both clinically and bacteriologically, all given full doses of antitoxin in amounts varying from twenty to forty thousand units, the accompanying Schick reaction was positive in eight or 22 per cent. of cases.

We have endeavored to find out if possible how long an attack of diphtheria with its natural and injected antitoixn will give immunity as shown by the Schick reaction. The following is from a series of cases, most of which were severe attacks of the disease.

From this table it is observed that the severe cases even with a large amount of antitoxin soon show a lack of immunity to diphtheria toxin. Thus in the case of John Volters who received 60,000 units on and before admission, being a very severe case, there was a mildly positive Schick reaction on the thirty-first day and on the thirty-fourth day the reaction was decidedly positive. Further studies of such results are necessary before definite conclusions regarding the length of immunity conferred, can be drawn.

Name	Type of Disease	Admittance Culture	Admitted	Amount of Antitoxin Given	Schick Dec. 4	Schick Dec. 7
Miller, Miss ..	Mod. severe	—	Nov. 20	10,000		—
Welz, Miss	Mod. severe	—	Dec. 5	20,000		—
Higgens, Mrs. Ed.	Severe	+	Nov. 8	40,000	—	
Volters, Mrs.	Severe	+	Nov. 3	40,000	—	
Ostrowski, Mary	Mod. severe	+	Dec. 2	30,000	—	
Volters, Mr. John	Very severe	+	Nov. 3	60,000	mild+	+
Mills, Mr.	Very severe	+	Dec. 2	40,000	+	
Carlton, Frank	Moderate	+	Nov. 3	20,000	—	
Shupe, Jack	Mod. severe	+	Oct. 25	20,000	—	
Williams, Miss	Immun. Nurse			3,000 4 wks. ago as prophylactic	+?	
Main, Joe	Mod. severe	+	Dec. 4	30,000		—
Jordan, Mrs.	Mod. severe	+	Nov. 23	20,000		+
Pape, Margaret	Mod. severe	+	Nov. 24	10,000		—
Fudge, Mabel			Dec. 6	25,000		—

REPORT OF DIPHTHERIA SITUATION AT GRACE HOSPITAL.

DETROIT, MICH.

On November 23, 1915, Miss Reed, a pupil nurse from Grace Hospital, upon commencing duty at Herman Kiefer Hospital was immuniz-

ed with 3,000 units of antitoxin. Seven or eight hours later she developed symptoms of an acute laryngitis with serum sickness. Because of hoarseness a culture was taken and returned negative. The laryngitis was then felt to be due to her serum sickness, possibly a slight edema of larynx. In a few days she returned to duty. On December 14 she returned to Grace Hospital for lecture and while there complained of feeling ill. She was sent to her room and that evening sent by Dr. McKellar to a private room in Grace Hospital. Here, owing to a decided laryngitis she was placed in a croup tent and given steam inhalations and a culture taken. This returned positive and Dec. 16 at 4:00 p. m. she was removed to Herman Kiefer Hospital. Since she had attended class and thus exposed all other nurses it was deemed necessary to immunize all susceptible contacts. A Schick test was performed on all pupil nurses and those house doctors and maids who may have been exposed. Fifty-seven tests in all were performed of which observations twenty-four hours later revealed seven positive or 12 per cent. Two of these refused antitoxin and were isolated and cultured, kept under observation until the epidemic was over. The others were each immunized with 2,000 units of antitoxin.

On December 18, Mr. Prately, age 59 years, a patient who had entered Grace Hospital three weeks before, was removed from ward 11 (Surgical) to Herman Kiefer Hospital because of a positive culture. He had had a sore throat for a few days and "there had been some spots" on his throat a few days ago but these had disappeared.

That day a Schick reaction was performed on all remaining patients of the ward and all nurses and orderlies who had occasion to be in the ward. The ward was also declared in isolation so far as visitors, etc., were concerned. Cultures of the throats of the patients were taken. All returned negative except one which was only suspicious. This one case was placed in isolation until another culture could be taken and examined, isolation was removed.

The second culture was declared positive and this case was ordered at once removed to Herman Kiefer Hospital. Owing to other conditions existing this patient on the advice of his private physician elected to be removed to his home.

Observations of the Schick reactions on these patients at the end of twenty-four and forty-eight hours showed a positive result in only one instance or 6 per cent. This patient was immunized with 1,000 units. Of seven nurses then Schicked similar observations showed four positive or 55 per cent. Of seven orderlies 0 or 0 per cent. gave positive results.

These susceptible contacts were each immunized with 2,000 units of antitoxin.

On December 23 Mr. Donohue, who on December 19 had shown a negative reaction to the Schick test, developed symptoms of sore throat. This was twice cultured twenty-four hours apart and each time the culture returned as negative. Because of its angry appearance it was deemed best to remove this case to the Herman Kiefer Hospital. Here two cultures were returned negative. Because of negative Schick on December 19 and four negative cultures this case was thought not to be diphtheritic. Another Schick reaction was performed and as it was positive in thirty-six and forty-eight hours 7,500 units of antitoxin were given. However, by this time the throat and general symptoms were almost entirely well. This was probably a case of follicular tonsillitis, possibly in some lowering his immunity to diphtheria as expressed by the Schick reaction. It also proves that immunity to diphtheria as expressed by this reaction is changeable in very short periods of time. This case rapidly recovered.

Both original cases rapidly recovered and the first exposure, Miss Reed, obtained three negative cultures at the end of sixteen days and the case from ward 11 gave two negative cultures at the end of thirteen days. The case sent home from ward 11 gave two negative cultures in seven days.

No other cases have since developed.

Summary.—Because of two known widely separated foci of infection (the nurse and the patient from ward 11) while not being actively engaged amongst the general population of the hospital some rigid precautions were necessary to endeavor to prevent a general outbreak.

Immunization of all contacts proved susceptible by the Schick reaction was therefore decided upon and proved itself a good index of immunity to diphtheria.

Because the exposures were known it was not thought necessary to culture any except direct contacts.

REPORT OF SCHICK REACTIONS PERFORMED AT THE FLORENCE CRITTENDON HOME

MARCH 9, 1916.

On March 7, Evelyn B., age 2 years developed sore-throat and symptoms of diphtheria, a cul-

ture taken proved positive for Klebs-Loeffler bacilli. Next day another child, age 3 years, developed clinical diphtheria corroborated by a positive culture. Neither of these children had been in the institution but four or five days so presumably one of both were exposed before entrance to the institution. Because both cases were from the first floor nursery it was deemed necessary to immunize all susceptible occupants of that ward, culture of the nose and throat also being taken.

Next day all cultures were returned negative, no carriers evidently being a source of the epidemic. Observations of the Schick reactions thirty-six hours showed a positive result in four cases or 16 per cent. These were each protected with 1000 units. No other cases have since developed.

Results of Schick test were as follows:

	Name	Age	Result
1.	Mildred	6 yrs.	—
2.	Harry	6 yrs.	—
3.	Wilbur	4 yrs.	—
4.	Harold	5 yrs.	—
5.	Dewight	4 yrs.	—
6.	Mary C.	3 yrs.	—
7.	Marjorie	4 yrs.	—
8.	Norma	3 yrs.	—
9.	Eva	3 yrs.	—
10.	Bruce	2½ yrs.	—
11.	Harvey	2 yrs.	1,000 U+
12.	Leona	5 yrs.	—
13.	Mildred B.	21 mos.	—
14.	Ginger	21 mos.	—
15.	Annabelle	3 yrs.	—
16.	Thelma	5 mos.	—
17.	Herbert	18 mos.	—
18.	Elmer	18 mos.	+ 1,000 U
19.	Martha K.	22 yrs.	+ 1,000 U
20.	Lizzie	29 yrs.	—
21.	Evelyn	20 yrs.	—
22.	Emiline	21 yrs.	—
23.	Meta	29 yrs.	—
24.	Marie N.,	23 yrs.	+ 1,000 U

REPORT OF DIPHTHERIA SITUATION AT CHILDREN'S FREE HOSPITAL.

On March 8, 1916, Mary Laverne, age 15 months and Ralph LaChance, age 7 years were seen at Children's Free Hospital, the former showing a discharging right ear and nasal discharge both of which were positive for Klebs-Loeffler bacilli and the latter showing signs of sore-throat also accompanied by a positive Klebs-Loeffler culture. Both were at once removed to the Herman Kiefer Hospital, next day the latter child developed a scarlet fever rash and was transferred to the scarlet fever ward. Both of these cases had been in the Children's Free Hospital but a short time, in fact is was the routine admittance culture 'n each case that demanded the investigation. On March 12 Joseph Balculo, age 5 years developed symptoms of diphtheria with extensive membrane on both tonsils and marked laryngeal involvement and was removed at once to the Herman Kiefer Hospital. Ten thousand units of antitoxin were then given intravenously by the jugular route and intubation was unnecessary and recovery rapid. As these latter cases (2) were both from the same ward it was deemed necessary to immunize all susceptible contacts. March 12 Schick tests were performed on all occupants of the ward; cultures of the nose and throat were also taken. Of the cultures taken the results showed a positive result in only one instant. This child showing a negative Schick was hence a carrier and treated as such upon removal to Herman Kiefer Hospital, no further antitoxin considered necessary.

Observation of the Schick reactions thirty-six hours later showed positive results in four cases or 27 per cent. These were each immunized with 1,000 units. Results were as follows:

Name	Age	Schick	Culture	
Ross Moore	9	—	—	
Vernon Severance	12	—	—	
Amelia Malevoch	4	—	—	
Harold M.	9	—	—	1,000 U.
Sam Michaelson	11	—	—	Hospital
Geo. Lozon	14	—	—	
Edward F.	10	—	—	
Ralph Sulky	7	—	—	
Annie Ochalck	3½	—	—	1,000 U.
Sam Silver	4½	—	—	
Zigmund L.	8	—	—	
Andrew F.	8	—	—	1,000 U.
Tracy G.	4	—		1,000 U.
Miss Farwell	19	—		
Miss Adams		—	—	

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SYMPTOMS AND EARLY DIAGNOSIS OF CANCER OF THE LARGE INTESTINE.*

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In order to combat malignant disease of any kind to be forewarned is to be forearmed. With a knowledge of the important symptoms which

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accompany malignant disease of the large intestine early in its onset its recognition may be accomplished in time to accomplish some good by properly directed treatment. In the past seventeen years I have had under my observation over two hundred cases of carcinoma of the large bowel involving various areas from cecum to anus. From the histories and observation of these cases many of the deductions in this paper have been drawn.

Before taking up symptoms it is well to note certain facts in connection with the incidence of malignant disease. In the first place my experience differs with the popular belief that the part played by heredity is of prime importance in the etiology of cancer of the large intestine. The majority of my cases do not give a family history of carcinoma at all and as a matter of fact more of my patients suffering from benign disease give such a history. Also comparatively few of my cancer cases give histories of previous benign disease. This will be referred to later in this paper.

In my series of cases about 65 per cent. occur in males and the majority of the cases occur in individuals below 50 years of age, the average age in men being 54, while in women it is 45. My experience has led me long since to abandon the expression. "The Cancer Age." There is no cancer age. My youngest case was 19 years of age and my oldest 87. The majority of my cases have occurred between the ages of 35 and 55. Regarding location will say that after leaving the anal canal frequently occurrences of cancer decrease in ratio to distance from the anal outlet. This statement is modified only by the fact that cancer is more prone to locate at the flexures and constrictions of the colon. Namely in ratio to the frequency: Rectum, sigmoid flexure, anus, cecum, hepatic flexure, splenic-flexure, descending colon and transverse colon.

Of all cancers occurring in the body 50 per cent. are found in the gastro-intestinal tract and 16 per cent. of these occur in the rectum which means that 70 per cent. of all cases involving the large intestine are located in the rectum and sigmoid. About one-third of these will be found in the rectal ampulla while one-tenth will be found in the anal region. The variety of growth found in the anal region is squamous-celled epithelioma, while adeno-carcinoma is the most common form in the rectum and lower sigmoid. Sarcoma is very rare in this region and is found in only about ½ per cent. of the cases. It is usually a round celled variety. The rectum as a whole is the most frequent location in the gastro-intestinal tract for cancer with the single exception of the stomach.

When one checks up the percentage of cancers located at the various constrictions of the gastro-intestinal tract he is at once struck with the marked relation which exists between carcinoma and chronic irritation, as evidenced by the marked frequency of malignant disease occurring at these points most subjected to irritation and trauma. While it has been stated above that comparatively few cases of cancer were observed in patients giving a previous history of benign disease in those cases who did give such a history the trouble was ulcerative in character.

SYMPTOMS.

Remembering that the age, sex and heredity of the patient, while important, have no definite bearing on the presence of carcinoma, one should carefully weigh all symptoms presented by the patient when endeavoring to make a diagnosis of early onset of malignant disease.

At the outset it should be stated that there are no definite pathognomonic symptoms of beginning malignant disease but there are several symptoms which should render a diagnosis reasonably certain and early enough so that treatment would be of some avail.

The earliest symptom of which a patient complains is usually a feeling of uneasiness or discomfort in the gastro-intestinal tract and he consults the physician for "indigestion." He will state that he has a feeling of bloating or fullness in the bowels usually sometime after eating and the sense of uneasiness is located by the patient according to the part of the bowel whose function is being disturbed. Sometimes accompanying this feeling of distress the patient will note a tendency to diarrhea which is noted particularly in the morning. The patient may notice some blood in the passages, the color of which will assist somewhat in locating the growth. The darker the color, the higher in the colon its source. If the growth is progressing without ulceration then no blood is noticed but an increased out-pour of mucus is observed.

Constipation may alternate with diarrhea and it is this symptom which is so often erroneously diagnosed as "colitis" and treated as such until the patient is beyond operative help. Pain is usually not present until considerably later in the disease. Occasionally pain running down the left leg simulating sciatica accompanies cancer which causes pressure on the sciatic nerve. Pain is of importance more on account of its absence than its presence. In malignant disease

in this part of the body unless obstruction has gone on to such a point that the distended bowel causes colicky pain there is practically no pain. It is only in cancer of the anus or anal canal that pain is an early symptom and then it is of such excruciating character that the patient consults his medical adviser early enough to get assistance in time to be of avail. On account of the fact that the rectum and colon is so meagerly supplied with sensory nerves pain as a warning signal often comes too late. Of course, further along in the disease emaciation, anemia and cachexia may be noted but when these symptoms appear the case has usually progressed to such a point that the hope of operative relief is reduced to a very small percentage.

DIAGNOSIS.

Four important elements in the diagnosis of carcinoma are: First, past history of the patient; second, present symptoms; third, examination by fluoroscope; fourth, proctologic examination. The early symptoms of bowel carcinoma simulate many other abdominal diseases and must be differentiated from the following: Disorders of the stomach, liver and pancreas, benign affections of the colon such as appendicitis, colitis, intestinal stasis, fecal impactions, intoxications and foreign bodies. The disease of the uterus tubes and ovaries in the female as well as the affections of the bladder and prostate in the male must also be ruled out. The presence of any of the benign rectal diseases such as hemorrhoids, fistula and fissure may often accompany malignant disease located higher up.

It has been my unfortunate experience seven times in the last two years to have cases referred to me who had been operated for hemorrhoids when the most cursory examination by the medical attendant would have disclosed a carcinoma situated in the rectal ampulla or recto-sigmoidal juncture. The disease for which carcinoma is most frequently mistaken is colitis. Patients complaining of frequent bowel movements which contain or consist largely of mucus with or without blood with accompanying loss of weight, and sallow anemic complexion are more often treated for colitis without being examined for carcinoma than any other class of patients who have had the same amount of medical attention. If the patient presenting any of the symptoms mentioned above would be subjected to a radiographic or proctologic examination, the presumptive diagnosis would be made possible. For carcinoma of the anus, rectum and sigmoid the digital and proctoscopic examination is sufficient. For carcinoma occurring higher than the sigmoidoscope will reach, abdominal palpation after administration of a bismuth meal and enema under the fluoroscope affords the best method of determining the location of a neoplasm in any part of the colon.

EXAMINATION.

The digital examination will in most cases be sufficient for the diagnosis of carcinoma of any portion of the ano-rectal canal up to the recto-sigmoidal juncture. The best position for this is the lateral or Sims position. On inserting the finger a hard mass will be found usually anteriorly or posteriorly. The hard indurated feel is different than that given by any other lesion. If the growth is progressing so that some necrosis has taken place, it will have a crater-like feel. The hard raised indurated edge and the smooth depressed center will feel not unlike the ulcerated cervix of the uterus. If the growth is of the encephloid type it will feel flabby instead of hard and indurated. Usually manipulation will start bleeding, but unless the growth is located in the anal canal there is little if any pain. On proctoscopic and sigmoidoscopic examination with the patient in the knee-shoulder position the rectum is inflated either by the pneumatic bulb or by atmospheric pressure. This will bring into view any lesions occurring within the rectum or lower sigmoid. A small ulcer granulated in appearance with or without necrotic center is suspicious enough to warrant removal of a section for microscopic examination. The area surrounding the growth is usually normal in appearance and the line of demarcation very well defined. It might be mentioned here that the inguinal glands are enlarged only if the growth occurs in perineum, anus or anal canal. The post-rectal or sacral and mesenteric glands are enlarged when the growth is in the rectum or sigmoid.

Usually a tumor of the sigmoid which cannot be located by the sigmoidoscope can be found by recto-abdominal palpation. One must not forget that the sigmoid being a movable organ, masses may be found in the left lower abdominal quadrant as well as centrally or to the right.

Carcinoma of any part of the colon above the recto-sigmoidal juncture may be located by palpation over the area of greatest distress. Then after proper preparation of the patient, the administration of a bismuth or barium meal and the injection of opaque enema fluoroscopic palpation will be of the greatest assistance in detecting the point of obstruction or constriction.

On account of the frequency of occurrence of carcinoma in the large intestine in patients of all ages it behooves every physician to subject every patient complaining of any of the symptoms mentioned above to a most careful examination in order to exclude the possibility of malignancy. If one can discover a carcinoma sufficiently early to warrant its removal by surgery so that useful years of life may be granted the patient the extra thought, time and trouble involved will be well worth while.

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RELATIONSHIP OF HEREDITY AND ENVIRONMENT ON PSYCHOSIS.*

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Ever since the history of the world heredity has been handed down as the great factor in the mental and physical development of the offspring. But today more attention is given to the breeding of lower animals. Laws are passed. A department is established in our national government which gives every possible aid to cattle breeders, how to raise and bring up good and healthy stock, but where can the poor young mother obtain any information as how to raise and bring up her baby; thanks to philantrophic societies, public lectures given by physicians and nurses to enlighten the bringing up of human beings.

Holt in his text book on Diseases of Infancy and Childhood starts out with the following:

"The physical development is essentially the product of the three factors, inheritance, surroundings, and food. The first of these it is beyond the physician's power to alter; the second is largely and the third almost entirely within his control."

While we must agree with him that inheritance is at present beyond the physician's power to alter, we however ought to do everything in our power to make it so that it can be altered in the future.

Laws have already been enacted in several states where the marriage of unfit persons by inheriting or acquiring perverted traits is prohibited and we hope to see the time when the medical man will have a great deal more to say on this subject in every state of the Union.

Some naturalists believe that the law of heredity applies only to the main characters of structure and not to details. There are two classes, one class where general peculiarites not traceable to any obvious causes are transmitted to descendants and the other class where the peculiarities bequeathed are not congenital but have resulted from changes of functions during the lives of the individuals bequeathing them. There are two modified manifestations of heredity; one, is that reappearance in offspring of traits not borne by the parents but borne by the grandparents or by remote ancestors. The other is the limitation of heredity by sex. The restriction of certain transmitted peculiarities to offsprings of the same sex as the parent possessing these peculiarities. Atavism is the name given to the recurrence of ancestral traits.

In heredity we have two factors to consider. First mentioned above, avatism, where the physical and mental organization and peculiarities may be transmitted from the first generation to the third without making their appearance in the intervening generation; thus the life and health history of the grandparents is important. Second factor is that rarely the actual diseases are transmitted by heredity. As a rule it is only a disposition to it that is transmitted.

In neurosis heredity is a very important predisposing cause. Parents pass down a general tendency to nervous diseases which is not developed into any distinct trouble unless some disturbing cause arises.

The mother transmits the neurosis more frequently than the father. In all the functional nervous affections such as hysteria, neurasthenia, mania, melancholia the influence of dissimilar heredity is very marked as they appear in families of alcoholics and syphilitics and epileptics.

A neuropathic diathesis showing itself in a nervous and mental instability is not infrequently the inheritance of a condition acquired in a near generation.

A man is as much a part of his ancestry and his posterity is of him as the root and stem are parts of one tree. One can inherit a quality, one cannot inherit the absence of one. What either parent has will come to the children—to all of them, if both grandparents had it also, to half of them of like sex, if it descends from only one.

But the parent who hasn't something simply hasn't it and that is all there is to be said. His children get it from the other side or they go without it. An individual affected with evil inheritance can never hope to mend matters by marrying into a sound family.

Drunkenness is considered a heavy link in the chain of hereditary predisposing factors. Marci reports the case of a drunkard who had sixteen children, fifteen of whom died and the

*Read before the Detroit Medical Club by invitation.

only survivor became epileptic. According to Darwin, the families of drunkards die out in the fourth generation.

Marel traces the generations as follows: (1 generation) moral degravity, alcoholic excess, (2 generation), drunkenness, maniacal attacks, general paralysis, (3) hypochondria, melancholia, murder, (4) imbecility, idiocy, extinction of the family. Even children of sober parents when begotten at the time of intoxication are in a high degree disposed to insanity and nervous diseases.

Drs. Charles A. Fife and Broden S. Weeda showed before the Philadelphia Pediatric Society a case reported in *Archives of Pediatrics* September, 1911. A girl 6½ years of age, who was normal at birth and grew until 18 months old but has not grown any since. Alcoholism in the mother; the parents and other children are of normal size. Table food was began at 18 months of age. She had several attacks of diarrhea, during the second summer, also pertussis and measles. Her total length is 80½ centimeters, length of foot 11 centimeters; greatest circumference of head 44.5 centimeters. There are no signs of cretinism, rachitis or tuberculosis present.

The Intermarriage of Relatives—A few words in connection with the intermarriage of blood relations. There are two views of the marriage of blood relations—first cousins for instance; that it is objectionable in itself, and that it is so only when there is some inheritable defect in the family with which both are connected. Assuming that the same laws hold good throughout the animal kingdom recent experiments on insects would seem to indicate that the latter opinion is correct. In the insect world a generation is so short that it has been possible in a few years to observe more than seventy-five generations in succession. A task that would have required 1500 years had human beings been the subjects of investigation, says a writer in the *Revue Scientifique*. Paris, Aug. 26, 1911.

Physicians believe that consanguineous marriages cause in their offspring sterility, malformations and very often idiocy and deaf-mutism. A case is cited of a consanguine family in which of the forty-three descendants there were ten abnormal in some way, three idiots, three deaf mutes and one suicide. According to statistics of 883 such unions with 4013 children, 61 per cent. were malformed.

Some authorities believe that consanguinity is objectionable only where the partners are constitutionally diseased and when both are strong and healthy the children have the ordinary chance of being perfectly normal.

Investigations of consanguinity in animals by Mr. Moeukhus have given contradictory results. He has followed for a term of years the descendants of several couples and has shown that crossing between brother and sister may be continued for seventy-five or more generations without the least injury.

Most men and women marry persons like themselves. Pearsons devised a means of computing accurately the degree of which any two objects can resemble each other, for example father and son.

Society needs specialized types. The chances that any child will inherit parents' qualities are just doubled when these qualities in addition to appearing in the individual man and woman run also in the parents' family. This is called Daltons law. In the total inheritance of any human being each parent contributes a quarter each, of the four grandparents a sixteenth, and each of the eight grandparents a sixty-fourth etc.

Every man of science in the past has reached the conclusion that inheritance is the important matter and that invironment counts for comparatively little, according to that the good fortune of choosing a wife will swamp any error of bringing up. That is not so.

Marriage is not an individual function, but a very prominent social one which should be prohibited among imbeciles, epileptics, dipsonmaniacs, syphilitics, old and mentally decayed people and lascivious men—who marry young women attracted by marriage from an economic standpoint.

Marriages especially between neuropathic persons or persons affected with organic diseases cause in their offspring psychic degeneration and morbidity.

An individual inherits from its parents and ancestors many characteristic; the tendencies, the instincts, the motivity, the intellectual force and the capacity of adaptation, special artistic and professional aptitudes, extravagances and eccentricities, tics, obsessions are all transmitted either indentically or in different form and as mentioned before these morbidities may remain latent in an entire generation and present themselves in a more aggravated way in the next.

Drunkenness and delinquency are of more degenerative significance than insanity. Drunkenness in itself is an expression of mental weakness, or in disease as dipsomania produces the greatest form of cerebropathy in the descendant

like infantile eclampsia, infantile encepalitis, idiocy, epilepsy, etc.

Alcoholic and syphilitic heredity can always be traced in epilepsy as the saying, "Alcoholism in the parent or grandparent epilepsy in the offspring." Heredity in the parent direct and similar is the principal cause of hysteria. Hysterical mother generally begets an hysterical daughter. The greatest forms of sexual perversions are certainly an expression of morbidity of the nervous system. In such cases we have almost always to deal with an inherited neuropathic and phychopathic constitution.

In reviewing Kraft Ebing work or any other authority on the subject there isn't a case without such a family history.

As one author puts it babies are alike to the precise degree as seedlings are, somewhat indistinguishable as the first two leaves unfold, but one becomes an oak, still young and vigorours after a hundred years; another blossoms and dies in one summer.

Society must protect the deficient and at the same time stand surety for them, provide asylums and schools for these individuals, to step in and advise families how to bring them up and educate them.

To education next to heredity man owes his mental character. All parents transmit to their children abnormal passions, defects of morals and eccentricities. Some in addition with a predisposition to psychopathies with feeble power of resistance to momentary impulses which tend to become fixed. They exhibit early exaggerated affectivity, emotivity, illogical, timidity, cruelty to animals and all other indications of primitive cerebral changes.

Such individuals often grow up with dreamy and fantastic natures, fond of contrasts, sensation and often finish by seeking adventures, or by failing to bring themselves to the realities of life, becoming subjects of neurasthenia or hysteria and frequently prematurely end their life.

In their infancy they are erratic, hysterical, impulsive and lacking in inhibitory control, easily receive impressions that prematurely arose and perverted sexual instincts.

Physically they suffer from headaches and frequently break down in schools.

Studies on this subject of physiological heredity have served to show how great an objection there is to accepting the view that acquired characters are transmissable.

The supposed examples of such transmissions are so rare and of so doubtful a character that eminent biologists like Valegli and Weisman have concluded that there is no such thing as epigenesis.

Instances are cited of families in which alcoholism and suicide have been frequent, but education, example, and the suggestion derived from precedent created a physical contagion that ought not to be confounded with heredity.

Dissimilar heredity of diseases, merely the effect exercised by the morbid process in the parent upon the germinal elements or upon the embryo, which is injured thereby and consequently develops with various defects. This is the way by which an alcoholic begets a depsomanic but is just as likely to promote an idiot or an epileptic.

Similar heredity of diseases in the only form in which transmissions of true organic characters can be recognized. Alienists see it in paronoia, juvenile dementia and the affective psychosis, melancholia, mania and periodic insanity.

The percentage of heredity among the insane is very high. We find clear heredity in paronoia 60 per cent., in dementia precox 90 per cent.

And truly they only inherit not a specific predisposition to melancholia, to mania or circular insanity, but merely a general predisposition to the affective psychosis and it is not improbable that the cause of such a predisposition lies in a special form of imperfect balance of metabolism, rather than in a hereditary alteration of the mental function, which would hardly answer such varied morbid forms.

The degree of instability metabolism and the disturbance of metabolism provoked by the nutrition and psychical state of the individual produce a multiplicity of reactive states—melancholia, mania or circular insanity according to the individual reactivity of the patient and the circumstances of the moment.

In these instances we have to deal with a diathesis, that has no direct relation to the intellectual mechanism and which is therefore able to modify its clinical expression within the limits indicated. According to moral heredity psychoses are communicated to the offspring always at an earlier age in each generation, and in a more severe form, and finally end by manifasting themselves at birth (congenital idiocy.) From all our study of the present knowledge as to the effect of heredity in mental diseases, it is not as supposed a law of progressive degeneration but rather a general law of psychical regeneration. It is probable that in virtue of the law, the number of the insane increases at a less rate than the total population.

Regarding the so-called degeneration stig-

mata, that is a difference of opinion. They are only signs and not causes. They mean that the disturbance has occurred in the development of the individual and some assume that the intelligence has also suffered in proportion.

I lay no stress upon the facial disturbances as ear marks, high palate etc.

Too much credit has been and still is given to heredity and too little to education and environment. But scientists are waking up all over to the effect that bad education and environment is worse than heredity in predisposing to psychosis. Criminals are almost always the products of existing social conditions, or of external influences that could in a large measure be avoided.

In the majority of criminals no degeneration of any kind is demonstrable, crime is almost always a reaction to social anomaly, injustice or prejudices. All the murders committed in this county the last two years were by young men and of good heredity. The same is true of conditions elsewhere.

Born prostitutes are very rare—the majority are made by poverty or seduction. Occupation, food, residence, family relations, customs, sexual habits are all cause of acquired psychoses Take the occupations of drivers, bar-tenders, they are all men addicted to alcohol, drug habits, etc. Almost all of the murderers in this city in the past few years have been bartenders, prostitutes, killing wifes or sweethearts.

Tanzi in his work on insanity says "among the causes of insanity the external act more widely than internal; and among the external causes somatic disorders and social irregularities are more to be feared than intellectual overstrain which has no harmful effect if it is not accompanied by hygenic, errors and depressing emotions. We must also recognize communicated insanities. They affect persons living together, that is a hysterical contagion and a paranoical and between these two extremes other conditions of insanity.

All authorities agree on two causes of insanity. The exegenous which is found by the environment and are not dependent upon the individuality of the patient. They are somatic purely psychical and social.

Of course the endogenous connected with the individual constitution and operate in any environment.

Then we have the form of insanity which depend only on external circumstances and the environment is the cause of the disease. And the form which arises only under the impulse of an internal predisposition. Between the two we have a series of mental diseases due to mixed causes. Congenital disposition may also arise without any hereditary influence like in anomalies of skull and maldevelopment of brain. Injury or disturbances of mother during pregnancy.

While I will claim later that higher education is the only remedy to eradicate from us all forms of weakness, prejudices and make us better in losing all our animal instincts, I must also warn against higher education indiscriminately used. Very often boys and young men become criminals for one reason—because their education has given them a distaste for manual labor. Civilization by wider differences of learning has been credited with favoring insanity. Economic difficulties in struggling for existence, strong emotions, weighing upon the brain exhaust it little by little and cause a disturbance in mental function.

The defects in education that give rise to predisposition of insanity are many. (a) Too strict treatment of an extremely impressionable, emotional child who is sensitive and so much in need of loving care. (b) An education that is too solicitous which can demand nothing and excuse everything. This cultivates obstinacy, morbid passions and emotions, defective self control and inability to practice self denial. (c) Too early awakening and strain of the intellectual powers produce neuropathics and phychoses.

The old fashioned teacher suffocates the activity of her pupil. The individual taste of each child must be respected. If the child fails to respond to any lesson the teacher must not urge. She must leave her alone, in order that the brain shall remain quite clear to receive a new impression, the next time this lesson is attempted.

The taste of each class of mind must be respected, encouraged and strictly observed.

Encouragement of perfect liberty does not injure discipline among young and nervously organized human beings, if their dignity and proper independence is respected and they are led to respect themselves.

After giving the child reasonable sanitary accommodations and after having means to place him and keep him in the best physical condition, we should suggest changes in the educational curriculum.

There should be no choice between health and education; only that education is effective which is founded upon and which secures good health. The child must be taught how to live.

Overstrain of the mental and physical powers of the precocious child is dangerous.

The exorbitant demands in schools can only be satisfied at the cost of sleep and physical development. In this way a neuropathic constitution is acquired; foundation laid for insanity, as they grow up to adult life.

Over education of the unfit bring forth tastes, habits and desires of which he should not know, and is the cause of more thieving, gambling and all around dishonesty than we appreciate.

The first requisite to success in life is to be a good animal and to be a nation of good animals is the first condition to national prosperity.

The training of children should be so carried on so as not only to feed them mentally for the struggle before them but also to make them physically fit to bear its excessive wear and tear.

Out of the many elements uniting in various proportions to produce in a man's breast that complex emotion which is called love, the strongest are those produced by physical attraction. The next in order of strength are those produced by moral attractions. The weakest are those produced by intellectual attractions.

Spencer says the goodness of a society ultimately depends on the nature of its citizens and since the nature of its citizens is more modifiable by early training than by anything else, we must conclude that the welfare of the family underlies the welfare of society.

So very profound is our ignorance of the laws of life that men do not even know that their sensations are their natural guide and when they are not rendered morbid by long continued disobedience their *trust-worthy* guides.

Efforts should be made to make early education amusing and interesting.

Lessons should cease before the child shows symptoms of weariness. Education must conform to the natural processes of mental evolution.

1229 David Whitney Bldg.

REPORT OF A CASE OF "OTOGENIC PHARYNGEAL ABSCESS" WITH REVIEW OF LITERATURE.

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December 21, 1915—Mr. E. D. R., Plainwell, Mich., male, age 46, white. American; occupation, laborer. Seeks relief for pain on the left side of head. General history is negative.

Special Nasal and Throat History.—Patient has occasional attacks of rhinitis and pharyingitis. Aural history. Patient had an attack of influenza in 1910 complicated by pain, deafness and discharge from the left ear. The recovery was rapid but has always been somewhat deaf in the left ear since the illness. On Dec. 8, 1915 patient had an ordinary attack of pharyngitis which continued a day or two, followed by rhinitis. There was very little soreness on swallowing and this disappeared in twenty-four or thirty-six hours. On December 12 the left ear began to ache accompanied by severe headache over temporal occipital region. The pain and headache increased until December 15 when he felt a fullness in the left side of his throat up and back of the palate, as he expressed it. This continued for a few hours when there was a rush of foul smelling pus into the throat during the night of the fifteenth which nearly suffocated him. This relieved him of some of his earache and temporal and occipital pain but instead of pain being constant it now has become more intermittent.

Status Praesens.—Patient is fairly well nourished muscular but pale and looks ill. Countenance reveals the presence of discomfort. Ocular, anterior nasal and pharyngeal examination and transillumination of sinuses are negative. Posterior nasal and upper pharyngeal, or more accurately called the nasopharyngeal, examination reveals all tissues edematous. In the region above and backward of the eustachial orifice the tissues are swollen, very soft, edematous and tender to touch. Between the pillars in the soft palate above the tonsil where we get peri tonsillar abscess this area is normal.

Functional Test of Left Ear.—Weber radiates to left ear. Rinne is negative. Can just hear watch tick when pressed on pinna. Spontaneous nystagmus is absent. Caloric test negative. Membrane tympani is normal except for some retraction and an old scar in the posterior quadrant. Malleus is slightly hyperemic. Referred to Dr. A. W. Crane for X-ray examination. The plate demonstrated a necrotic mass of cells in above and behind the antrum and in the mastoid cortex. The cells in the cortex are not so completely necrosed as those in the attic and posterior zygomatic region.

Operation Under General Anesthesia.—Heath's conservative mastoid operation was done on December 23. Nothing important was found except that the necrosis in the mastoid cavity and antrum was very extensive forward, inward and backward and downward. Pneumatic cells were very plentiful in the tympano mastoid bone and there is little doubt in my mind but that the abscess blazed its way to the lateral pharyngeal wall through the pneumatic spaces adjacent to the eustachian tube.

Patient now hears watch at twenty-three inches and has been completely relieved of pain and headaches.

In 1906 Holmes reported a case similar to this and mentioned the fact that several otologists had remarked that they had never seen such a case.

Dan McKenzie has written that in observing many cases of suppuration of middle ear one is impressed with the occasional occurrence of the unilateral swelling of the posterior lateral pharyngeal wall, probably an adenitis which has

not progressed to abscess formation. Of course septic adenitis in this situation may be ascribed to infection from the nose or naso-pharynx but the retro pharyngeal adenitis and the middle ear suppuration may be looked upon as an independent process but arise from one cause.

Galge's researches in cancerous growths of middle ear demonstrated that there is lymphatic connection between the middle ear and the lymphatic nodes of the pharynx so that infection of the pharyngeal gland can result easily from the middle ear infection.

PATHOGENESIS.

Owing to the fact that this patient had a spontaneous rupture of the pharyngeal abscess and that the surgical relief adopted was successful I cannot demonstrate any pathological specimens. I arrived at a diagnosis from clinical data. The literature upon the subject contains but little post mortem evidence. One case reported by Williams of London has post mortem evidence to demonstrate facts.

There are four different ways in which otogenic pharyngeal abscess may be produced. First by direct extension of the purulent disease from the middle ear through the petrous bone to the pharynx, secondly by the wandering of an extra-dural abscess of the middle cranial fossa to the tip of the petrous bone and thence by the foramen lacerum anticum or otherwise to the inferior extra-cranial surface of the petrous bone; thirdly by direct extension of the purulent diseases from the pneumatic cells in the tympano-mastoid osseous structure to the under surface of the occiput and thence to the pharynx in a manner explained later; fourthly by the wandering of an extra-dural abscess of the posterior cranial fossa to the same sub-occipital region.

We can conveniently describe the various routes by grouping the first two under the heading of sub-petrous variety and the last two under the sub-occipital variety.

The key to these two regions is the rectus capitis lateralis muscle which extends from the transverse process of the atlas upward to the jugular process of the occipital bone. The surface land mark is the posterior wall of the auditory meatus. It thus stretches like a curtain across the space between the atlas and the occiput and extends laterally from the styloid process to the occiptal condyle so that it divides the region into an anterior of sub-petrous region and a posterior or sub-occipital region. The sub-petrous region contains the styloid process and its muscles, carotid sheath and structures lateral to the pharynx. The sub-occipital region contains the insertion of the deep posterior and lateral cervical muscles the posterior condylar foramen and the vertebral artery and so on.

Cheatle and Mouret have pointed out that the apex of the petrous bone which is as you know in close apposition with pharynx may contain cellular extension from the mastoid which passes between the cortex of the petrous and the upper limits of the labyrinth capsule, the supra-labyrinth cells above the internal meatus. Indeed, cells may extend inwardly from the floor of the tympanum between the labyrinth capsule and the jugular bulb, the sub-labyrinth cells to the apex of the petrous below the internal auditory meatus and in relation to the carotid canal.

Some of the writers have called the attention of the profession to the canal for the tensor tympani as a likely route by which pus may reach the pharynx. This canal is about 10 to 15 millimeters in length and is located in the roof of eustachian tube. It passes forward as far as the spine of the sphenoid and adjacent parts of the greater wing of that bone so that pus following its fibres would certainly arrive at a position in the lateral pharyngeal wall. Guillimen points out that the muscle would be more likely to obstruct than to promote the development of the disease unless its fibres were destroyed by every virulent infection. If the canal were the offending part of this disease process otogenic pharyngeal abscess would likely be more frequent because this canal is a constant structure. Knapp has reported post-mortem findings that demonstrated that pus did actually take this route to reach the pharynx.

Haug reported a case of a piece of cotton wool that had been inserted in the external auditory canal by the patient himself that had finally been recovered from an abscess in the pharynx. The cotton was either pushed through the floor of the tympanum and then migrated towards the pharynx outside the eustachian tube or it ulcerated its way through its walls.

The carotid canal is frequently surrounded by pneumatic spaces which form a good route for pus to follow from the middle ear. Some cases have been reported with such pathology.

In this connection I might mention Grunert's case in which the posterior wall of the carotid canal at the apex of the pyramid had become separated and was found lying loose in pus. The carotid canal itself was so filled with granulations that the carotid artery was compressed to a fine tube "the size of a knitting needle."

It is now a well known fact that the majority

of extra-dural abscesses develop from the roof of the tympanum. To reach the apex of the petrous bone it has to burrow downward, forward and inward between the dura and the anterior surface of the pyramid. The superior petrosal sinus would form an easy route for the pus to reach the foramen lacerum anticum but when it did arrive at such a point the dura is so firmly adherent to the edges of the foramen that it would prevent further progress of the abscess but when the abscess does find the under surface of the petrous bone it may present in the pharynx in two places; first, above the upper border of the superior constrictor within the lateral pharyngeal fascia; secondly, if it follows the downward and inward direction of the levator palati muscle which is attached to the cartilaginous portion of the eustachian tube it may point in the palati above the tonsil very much in the position of a peri-tonsillar abscess. All peri-tonsillar abscesses that occur during an acute attack of middle ear disease should be investigated as to their relationship.

Permit me to mention those cases of Hessler Kafler and others in which fistula occurs in the anterior meatus which result from an abscess in the pterygoid or pharyngeal region; or diseases of the pneumatic cells in the anterior meatal wall or defects therein the result of which is an ulceration into the external auditory canal.

The second class or the sub-occipital abscess results directly from pus gravitating from the bone cells of the mastoid or occipital bone or traversing the posterior cranial fossa usually as an extra-dural abscess. The sub-occipital region may be defined as that part of the cervical region immediately below the occiput which lies posterior to the styloid process and rectus capitas lateralis muscle; medial to the inner aspect of the mastoid process; lateral to the margin of foramen magnum and the occipital condyle and anterior to the superior curved line of the occiput.

Through the researches of Cheatle, Perez and Mouret they have shown that the cells that are concerned most in the infection of the deep cervical tissues in the sub-occipital region are those of the digastric triangle "or sinuso-digastric cells." These are located in the inner wall of the mastoid cavity midway between the vertical part of the lateral sinus and the posterior wall of the external meatus, the antrum and the mastoid apex. They should always be scrutinized for they may invade the occiput or sub-labyrinth or may lead to the jugular foramen.

We now pass to the extra-dural abscess in the posterior cranial fossa and the indirect way it enters the sub-occipital region. Some believe that these follow the jugular vein down to the jugular foramen and then find their way into the pharynx. Guillimen criticises this view from the fact that the nerves in the jugular foramen are not injured. Too, the dura is very adherent around the border of the foramen and abscesses do not rupture here as often as indicated by some writers. Guillimen suggests that the abscess emerges through the occipito-mastoid suture where it traverses the jugular foramen. This would bring it into the sub-occipital region. If an abscess did rupture through the dura at jugular foramen it would be retained within the carotic sheath which is attached to the bone around the carotic canal and foramen lacerum posticum. Peri-sinus pus can leave the skull through the occipito mastoid suture, the mastoid emissary vein higher up, the posterior condylar foramen, the foramen magnum, anterior condyloid foramen and the canal for the hyopglossal nerve. In this canal there is a venous plexus dependent upon the lateral sinus. So during the lateral sinus thrombosis if this becomes thrombosed a pharyngeal abscess may be promptly initiated. Too, the bone of the skull is very thin at either side of foramen magnum, hence this may be eroded by the liquefacient properties of the pus and break through. When an extra-dural abscess migrates from the skull through any of the avenues mentioned it becomes a sub-occipital abscess and the infection spreads to the deep cervical tissues and localizes behind the sterno mastoid or it might gravitate to the pharynx. This could not go lower than the cricoid cartilage because the fascia of the lateral pharyngeal wall unites with the esophagus just above the cricoid cartilage.

Guillimen says that if an abscess finds its way unto the sub-occipital region behind the rectus capitis lateralis, to its medial border between this and the occipital condyle where there is but one layer of fascia the erosion and neerosis produced by the poisonous products of the pus destroys the barrier and opens up an avenue to the pharynx. The route around by the styloid process is protected by the rectus capitis lateralis muscle parotid fascia and carotid sheath.

SYMPTOMATOLOGY.

History of middle ear and mastoid involvement. This may be acute or sub-acute or latent. There may be symptoms of labyrinthitis or paralysis of 3, 4, 5, 6, 7 cranial nerves. Accompanying these disturbances there may occur

increasing difficulty of swallowing, edema and swelling of lateral pharyngeal tissues. A sore throat complicating a middle ear or mastoid disease should be investigated. If abscess occurs in the pterygoid region there is edema, pain on same side of head below the zygoma. There is painful closure of the jaw because the internal pterygoid muscle aids in this function.

You will notice that the case just cited bears a close analogy to the more "latent" or "remote mastoiditis" in which an inflammation in the middle ear clears up with or without perforation of the membrana tympani, but spreads to the peripheral cells of the mastoid in which an abscess is often developed at a later period. The essential point of divergence in the two classes of cases is that, in the one, the inflammation spreads from the anterior part of the tympanum forward into the peritubal cells and so to the petrous bone, whilst in the other the infection travels backwards from the attic to antrum and thence to the mastoid. Probably the slow and insidious spread of the inflammation in both classes of case is due not only to the anatomical character of the temporal bone ("pneumatic" type) but also to the nature of the infecting organism.

DIAGNOSIS.

The combination of discharging ear or tender mastoid bone with pharyngeal abscess with temporal or facial edema, fixation of jaw or cervical cellulitis should lead one toward a correct conclusion.

Treatment Surgical.—With regard to treatment it would be necessary to open the abscess and drain it after trephining the squama above the tympanum and stripping the dura from the roof of the petrous bone. The route would be the same as for the intra-cranial operation on the Gasserian ganglion. The principal risks would lie in tearing the middle meningeal at the foramen spinosum or tearing the softened or firmly adherent dura matter and causing infection of the subarachmoid space. The difficulty lies in diagnosing the presence of an abscess, as distinct from the commoner condition, non-suppurative inflammation of the apical cells. As a rule these cases recover spontaneously. In the cases here reported the symptoms never seemed sufficiently severe to preclude the probability of spontaneous recovery so that the advisability of doing an intra-cranial operation was never considered.

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OSTEOMA OF THE FRONTAL SINUS—REPORT OF A CASE.

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WEST BRANCH, MICH.

M. H., boy, age 15, consulted me during the first week of June 1914, desiring to know what the lump was that was located just above the inner end of the right eyebrow. The only complaint was the disfigurement, there being no symptoms whatever.

Anterior horizontal view. About another time larger than tumor really is. The groove down the front is where I chiseled away a part.

He was told he had a tumor of the bone, and came to my private hospital at West Branch for his operation, on June 12, 1914.

After elevating the skin and frontalis from the line of incision along the supra-orbital margins, the periosteum was incised to form two

M. H. at 17: Showing the depression that still exists.

flaps turning away from the prominence. It was then found that a part of the outer table together with the inner end of the right supra-orbital margin had been obliterated, and that the tumor was protruding from the sinus. After sufficient of the outer table had been removed the tumor was lifted easily from the sinus; it had a broad base or pedicle attached to the inner table. Numerous depressions of the inner table were found; also an opening into the left sinus. The point of attachment on the inner table was carefully curetted, the periosteal flaps allowed to fall into the cavity, and the incision of the skin and frontalis sutured. The wound healed nicely; the patient leaving for his home at the end of a week.

The specimen was submitted to Dr. A. S. Warthin at Ann Arbor for pathological diagnosis. He reported "an osteoma eburneum, of the ivory exostosis type."

There has been no sign of recurrence in the two years that have passed since operation.

DO YOU KNOW THAT

To-day is always the best day to clean up?

Fresh air, food, rest—these three combat tuberculosis?

The U. S. Public Health Service has reduced typhoid fever 80 per cent. in some communities?

Overeating, constipation, lack of exercise, foul air, eye strain, may produce headache?

Polluted drinking water causes many deaths?

An efficient health officer is a good community investment?

Bad teeth handicap children?

Insufficient sleep endangers health?

Larkspur for Pediculosis Capitis.—Various formulas for tincture of larkspur for use against pediculosis capitis have been published, but larkspur is poisonous and harm may result where there are abrasions of the skin. Many prefer kerosene. It is applied under a suitable cap. After twenty-four hours the hair is combed to remove nits and then washed (*Jour. A.M.A.*, March 18, 1916, p. 913).

Clinical Report on Arsenobenzol.—"Arsenobenzol" is being made by the Dermatological Research Laboratories of the Philadelphia Polyclinic. It is stated to be chemically identical with salvarsan. O. S. Ormsby and J. H. Mitchell report a series of 184 injections given to seventy-five patients suffering with syphilis in its various stages. They report that the action of this drug has been uniform, its toxicity low, and its therapeutic results excellent (*Jour. A.M.A.*, March 18, 1916, p. 867).

Colloidine.—Collodine (Boracol Chemical Co., agents) is claimed to be "A Colloidal Vegetable Iodine Combination," each tablet of which is stated to represent one-third grain iodin. Because of the colloidal character of the iodin compound, colloidine is claimed to be an especially efficacious iodin preparation. The Council on Pharmacy and Chemistry reports that colloidine is ineligible for New and Nonofficial Remedies because, as shown by examination in the A.M.A. Chemical Laboratory, the iodin was deficient in amount and in a form of an iodid or in a form which so readily yields iodid that the therapeutic effects of colloidine would seem to be those of iodids; and because the therapeutic claims were unwarranted (*Jour. A.M.A.*, March 11, 916, p. 831).

Emetic Action of Drugs.—The investigation of R. A. Hatcher and C. Eggleston show that the nauseant and emetic action of many drugs is not due to their effects of the stomach, but to a central action on the "vomiting center." Practically all alkaloids and alkaloidal drugs which have emetic properties, including morphin and preparations containing it, emetin, cephaelin, quinin, nicotin, lobelin, pilocarpin, aconite and veratin, ergot and apomorphin, which produce nausea or vomiting as their chief or side actions, do so by direct effect on the vomiting center. Sodium salicylate, picrotoxin and digitalis also produce vomiting through central action. These investigations show the futility of the many devices which have been employed in attempts to avoid the nausea or emesis produced by many drugs as an undesired side-effect (*Jour. A.M.A.*, March 11, 1916, p. 817).

TRANSACTIONS

OF THE

Clinical Society of the University of Michigan

Stated Meeting, March 1, 1916

The President, UDO J. WILE, M.D., in the Chair
Reported by REUBEN PETERSON, M.D., Secretary

HISTOPATHOLOGIC STUDIES OF MULTIPLE SCLEROSIS.

(Lantern Slide Demonstration)

THEOPHIL KLINGMANN, M.D.
(From the Laboratory of the State Psychopathic Hospital)

The histopathology of multiple sclerosis has been carefully studied and described. Nevertheless the pathologic changes found in various elements of the nervous system have not been satisfactorily correlated. The material for the author's observations was obtained from the Michigan State Hospitals for the insane and was transferred to me by the director of the State Psychopathic Hospital, Dr. A. M. Barrett, to whom I am much indebted for this excellent opportunity. The clinical records of the cases, three in number, were made at the State Hospitals for the insane and which I will relate briefly as follows:

1. (309) A man of 54 years who was under observation at the Kalamazoo State Hospital for the insane for four years. The duration of the mental disorder was about nine years and the history indicates that definite neurologic signs existed for five years.

The neurologic examination is rather incomplete but it was noted that the patient had a marked tremor of the hands and almost continuous choreiform movements of the head, arms and hands. His station was unsteady with the eyes closed. The tendon reflexes were all increased and an ankle clonus was elicited on the right side. There was a marked speech defect and the patient spoke very slowly. Shortly before his death he developed bed sores.

The mental symptoms were very marked, consciousness was markedly clouded, the memory was poor and he developed delusions and hallucinations of sight and hearing. Later in the course of the disease he showed marked mental deterioration.

2. (302) A man 44 years old who was under observation at the Kalamazoo State Hospital for the insane for six weeks.

The duration of his mental disease was two years. While at the Kalamazoo State Hospital he had several paretic seizures of short duration involving the right side of the body. He complained of headache and nausea, shortly before his death, had a number of convulsions and died some hours after one of these attacks.

The patient was a very large and muscular man. He was unable to walk or stand. The left hand and arm were paralyzed. The right side of the face was immobile and the tongue deviated to the right. The speech was scanning and there was marked deafness in both ears. The sense of taste and smell was much impaired. The left forearm was rigidly held in flexion and there was marked atrophy of all the muscles of the left forearm and small muscles of the left hand. On the ulnar side of the left forearm tactile sense was lost. In the right hand there was a marked tremor occurring on volition. There was some muscular atrophy of the flexors and extensors of both legs.. All tendon reflexes were exaggerated. A Babinski toe reflex was present on both sides. The patient had incontinence of urine and feces.

Mental Examination: Consciousness was clear but the patient was disoriented for time and place. School knowledge was well retained, although the memory was defective and judgment impaired. The emotions were staple and there were no disturbances of will. The patient had auditory and visual hallucinations and delusions of persecution.

3. (412) A man 49 years old who was admitted to the Eastern Michigan Hospital for

the insane where he was under observation for three years, which marked the termination of the case.

He complained of lancinating pain in the back, joints, legs and at the exits of the sciatic nerves, and failing sight. During the first part of his illness he had an apoplectiform seizure and lost the use of his left arm and leg. He partially recovered the use of the left arm but not of the leg. He experienced several cerebral seizures consisting of coma, with consequent paralysis of the lower facial muscles of the left side. During these seizures there was an elevation of temperature varying between 102 and 103 degrees F. With each seizure the paralysis became more marked but remained localized. The reflexes, lost during the seizures, were increased at other times. There was an ankle clonus and Babinski toe reflex on the left side. In the left arm and leg there was considerable atrophy of the muscles. Light touch and pin point was more perceptible over the left side of the face, left arm and leg but otherwise there was no disturbance of cutaneous sensibility. There was a decubitus on each side of the buttocks. Three years later his right side became weak which was evident only in a general asthenia.. From the very beginning of

CLASSIFICATION ACCORDING TO LOCATION OF LESION

I. Spinal
- 1. Dorsal
- 2. Cervical
- 3. Lumbosacral
- 4. Sacral
- 5. Mixed

} Dorsal and mixed, most common.

II. Cerebral
- 1. Psychic
- 2. Hemiplegic
  - A. Form in which hemiplegia originates like apoplexy and may be residual.
  - B. More chronic cases in which hemiplegia is progressive.
- 3. Pseudobulbar—Common Type. At times hard to differentiate from cerebral arteriosclerosis.
- 4. Cortico-epileptic. Rare.
- 5. Tumor Type.
- 6. Pontine or Bulbar—With the especial forms of sclerotic encephalitis of pons and medulla.
- 7. Cerebellar.
- 8. Ocular.

III. Cerebrospinal. Classical form to which majority of cases belong.

IV. Miscellaneous According to Symptoms.
- 1. Benign form.
- 2. Rare form with remissions lasting ten years +.
- 3. Latent cases with slight clinical signs and symptoms.
- 4. Familial Form. Question whether this form occurs.
- 5. With Pain
  - A. Sclerosis multiplex dolorosa with trifacial neuralgia, etc.
  - B. Apoplectiform attacks with unilateral paresthesia and pain.
  - C. Headache.
- 6. Vasomotor. Rare.
- 7. Oculopupillary. Unilateral narrowing of pupil and palpebral fissure.
- 8. Disturbances of body temperature.

PLATE I.

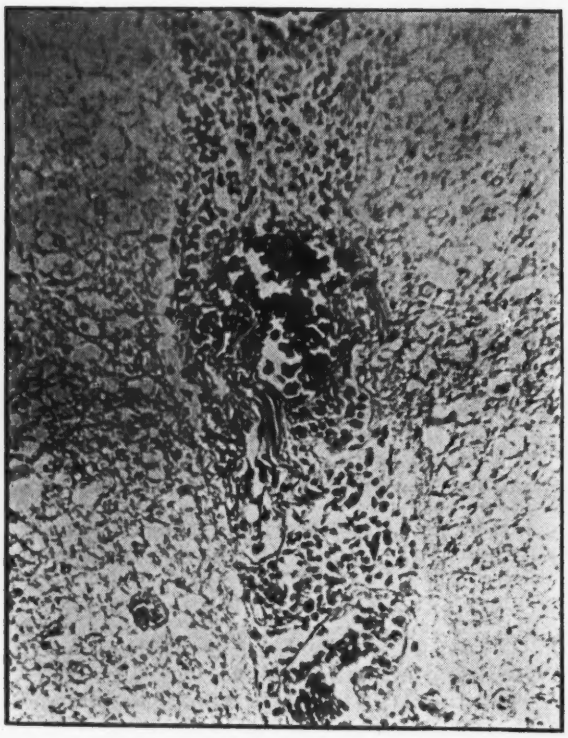

Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

PLATE II.

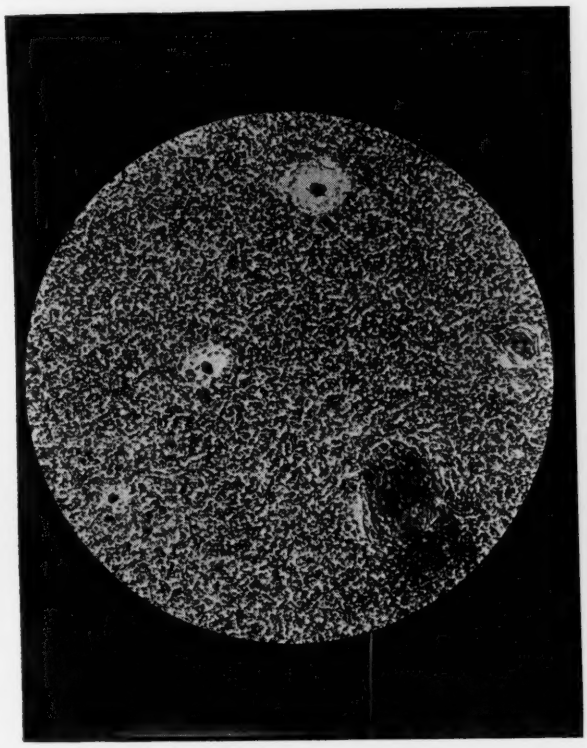

Fig. 5.

Fig. 6.

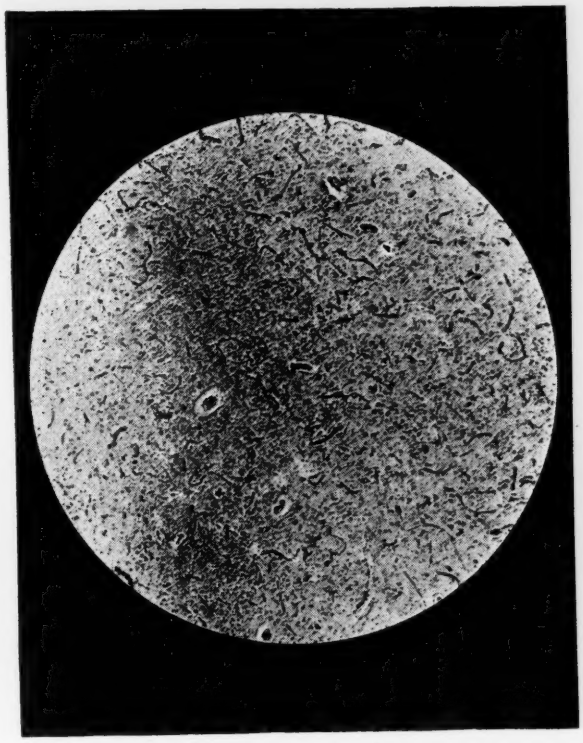

Fig. 7.

Fig. 8.

PLATE III.

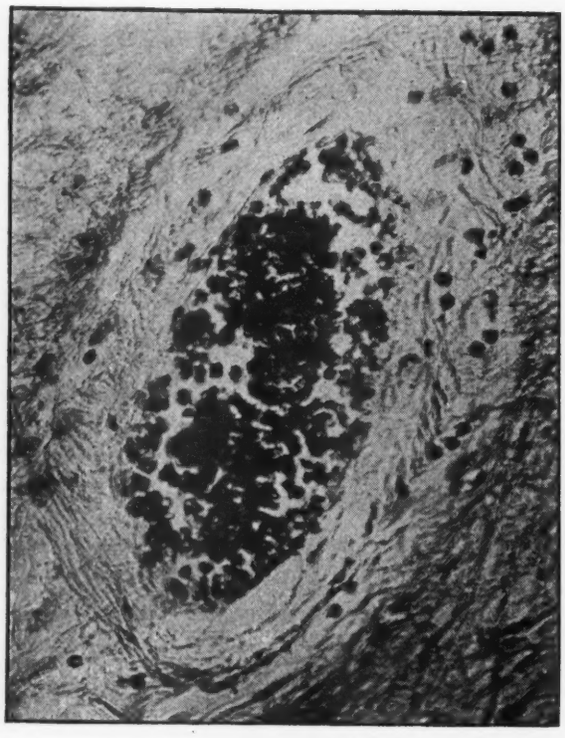

Fig. 9.

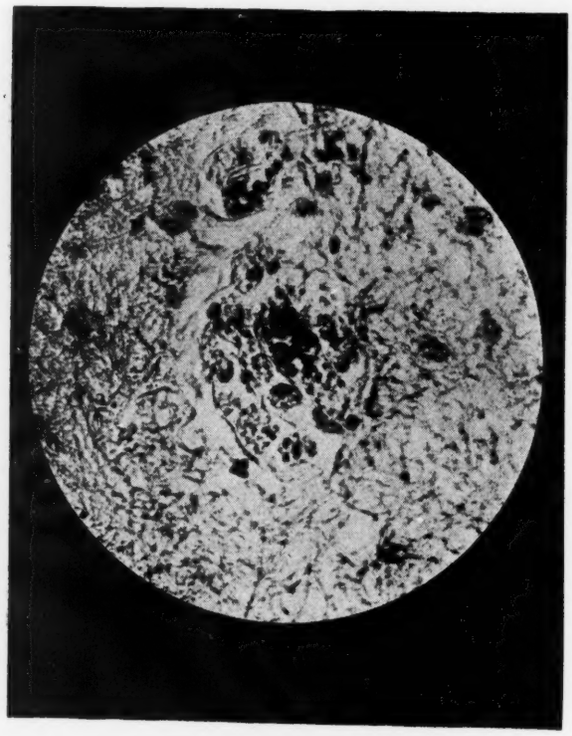

Fig. 10.

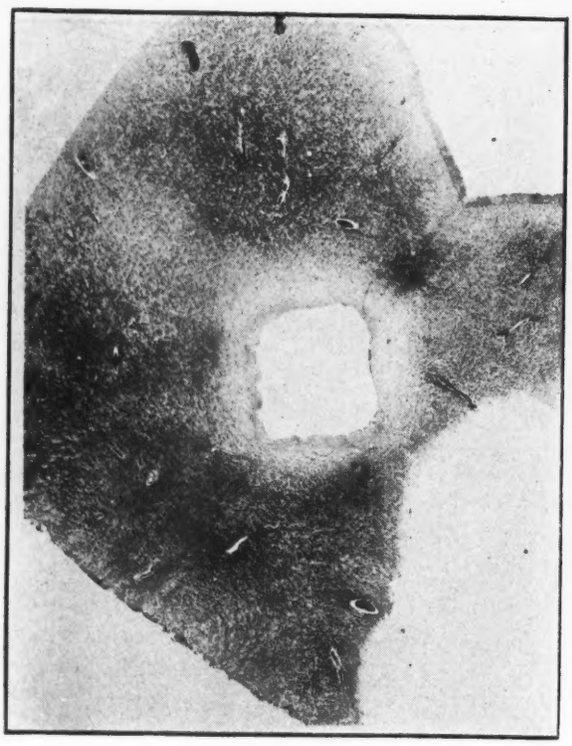

Fig. 11.

Fig. 12.

PLATE IV.

Fig. 13.

Fig. 14.

Fig. 15.

Fig. 16.

of the disease there was pronounced ataxia of the fingers of both hands, gradually extending to the arms and finally involving the legs. There was a marked intention tremor of both hands. The speech was scanning.

Mental symptoms appeared in the last year of his illness which consisted of emotional instability and marked optimism with reference to disease. The slightest provocation caused pronounced irritability, at other times involuntary outbursts of laughter. The judgment was defective and the facial expression was silly with a broad grin over the face most of the time. The ophthalmoscopic examination revealed nothing abnormal although the vision was poor. The cerebrospinal fluid was normal.

The autopsy findings were not unusual and I will therefore not review them at this time. However, it is of interest to note that in two of the cases pulmonary tuberculosis and in one, glandular tuberculosis was found at the autopsy.

For a brief review of the various forms of multiple sclerosis and the distribution of the lesions I offer the following classification:

CLASSIFICATION ACCORDING TO CLINICAL FORMS

1. Acute..
2. Subacute.
3. Chronic.
4. Remittent.
5. Chronic Progressive with remissions and exacerbations. Remissions may last ten years.

EXPLANATION OF PLATE I.

Fig. 1. A horizontal section of a blood vessel in the region of the posterior horn of the left lateral ventricle showing a marked exudate into the vessel wall and the perivascular space. The cellular elements are mostly mononuclear leucocytes. There are also red blood cells and along the center of the vessel wall may be seen numerous plasma cells. Bordering the perivascular space is a layer of rather large and irregular neuroglia cells. The surrounding tissue shows a marked neuroglia proliferation. (Van Gieson stain).

Fig. 2. An oblique cross section of a vessel in the region of the left optic radiation showing large irregular spaces between the trabeculi of the tissue of the vessel wall in which are seen a few mononuclear cells. Surrounding the vessel there is a dense felt-work of neuroglia fibers. At one side and at each end of the section of the vessel the neuroglia proliferation has obliterated the perivascular space and has invaded the vessel wall. (Phosphotungstic acid hemotoxylin stain).

Fig. 3. A section from the caudate nucleus showing a marked perivascular gliosis with but a remnant of the vessel wall remaining in the center. (Phosphotungstic acid hemotoxylin stain).

Fig. 4. A cross section of the lenticular nucleus. A silver preparation according to Bielschowsky showing a marked divestiture of neurofibrils in the region of the plaques. In the center of each plaque an occluded blood vessel is plainly seen.

EXPLANATION OF PLATE II.

Fig. 5. A section of the white substance near the subcortical margin showing a number of homogeneous plaques; in the center of each are red blood cells. At the lower margin of the section is a circumscribed area of gliosis in which the neuroglia fibers are easily differentiated and in the center of this area is a blood vessel. (Van Gieson stain).

Fig. 6. A section of the cortex showing an almost structureless area in the center of which are remnants of a degenerated blood vessel. The tissue surrounding this area consists largely of neuroglia fibers. (Van Gieson stain).

Fig. 7. A silver preparation of the cortex according to Bielschowsky's method showing a marked increase in blood vessels and strikingly few neurofibrils.

Fig. 8. A blood vessel under high magnification showing a marked granular condition of the endothelium bordering the lumen. The vessel wall contains irregular spaces in which are found cells of mesodermal and ectodermal origin. The irregular dark bodies in the vessel wall and in the perivascular space are phagocytic neuroglia cells filled with fat. (Herxheimer stain).

EXPLANATION OF PLATE III.

Fig. 9. A large vessel from the periventricular region showing a marked perivascular gliosis. The vessel is surrounded by numerous neuroglia cells. The vessel wall is impregnated and almost obliterated by neuroglia fibers. There is no perivascular space. (Phosphotungstic acid hemotoxylin stain).

Fig. 10. A blood vessel from the cortex showing phagocytic neuroglia cells in the meshes of the vessel wall. (Phosphotungstic acid hemtotoxylin stain).

Fig. 11. A cross section of the aqueduct of Sylvius, showing a granular ependymitis.

Fig. 12. A portion of the section of the aqueduct under higher magnification showing

a marked neuroglia proliferation causing irregular elevation in the lumen. (Phosphotungstic acid hemotoxylin stain).

EXPLANATION OF PLATE IV.

Fig. 13. The tissue surrounding the posterior horn of the left lateral ventricle shows numerous degenerated neurofibrils. They appear as very tortuous spirals as can be readily seen in the margin of the section. They are not unlike the spirochete found in the paretic brain; in the silver preparation as this is, they stand out much more prominent than the normal nerve fibers.

Fig. 14. Two thrombosed vessels with marked perivascular gliosis.

Fig. 15. A section from the cortex showing the formation of a plaque and the irregular arrangement of the nerve cells as well as changes in the form of the cells. (Nissl stain).

Fig. 16. A section of the cortex showing a marked divestiture surrounding a sharply circumscribed well preserved cortical area. (Bielschowsky's method).

The illustrations lead to the conclusion that there is an inflammation with a marked exudate into the vessel walls and into the perivascular spaces. A reaction in the myelin sheaths and in the neuroglia as well as the mesodermal connective tissue is very apparent.

DISCUSSION.

DR. ALBERT M. BARRETT: I am very much interested in this work of Dr. Klingmann. It seems strange that a disease so common as multiple sclerosis, one of the most common of all nervous diseases, should have so obscure a pathology. We have known for a long time the gross appearances of the lesions and the clinical symptoms, but the origin of the process still remains obscure. It has for a long time been thought that the only way one could account for the irregular distribution was by a vascular origin. Dr. Klingmann has very well shown the intimate relations which vessels bear to the distribution of these processes. Unfortunately it seems that the acute changes which one really wants to know about in these conditions seem not to have been studied, probably on account of the lack of material. One finds in most cases of multiple sclerosis all kinds of stages of a process. Most of the cases one sees rarely die in the acute stages of the disease so one has the mere clinical and secondary reactions to study. One cannot speak too highly of efforts to solve this question, because it still remains a disease which is very obscure in its pathology.

As far as the gliosis is concerned, it is a question of secondary reaction. The primary cause is to be sought in some factor, possibly toxic, distributed through the vessel spaces and lymph sinuses which disintegrates the myelin around the vessels and then one gets the neuroglia. And evidently one gets at the same time the inflammatory reactions which Dr. Klingmann has shown.

DR. CARL D. CAMP: This condition is certainly more common than is generally recognized by the profession and deserves very careful study. I have been especially interested in the way in which changes in the symptomatology can occur. When we see these cases post mortem it is difficult to realize that these sclerotic areas, so-called, cannot be permanent. When we see the cases clinically we see the symptoms, such as loss of reflexes, appear and disappear. The symptoms are so transient that it seems necessary that we think of a cause which at times acts and at other times ceases to act.

DR. UDO J. WILE: I should like to enquire about the fat cells around the blood vessels and to ask Dr. Klingmann if this change is in the nature of a fatty degeneration or whether the fat is carried there as a foreign body. There is an analogy in certain changes that one meets in general pathology where circulating lipoid is deposited in the endothelium of the blood vessels and produces changes there that react upon the connective tissue and give rise to a fibrosis, which resembles the process which Dr. Klingmann describes.

DR. KLINGMANN: I might add that all of these patients had tuberculosis. Two had pulmonary tuberculosis and the other had a glandular involvement.

In regard to the variations of the symptoms, attention has been called to the fact that there is an increased amount of lymph and we notice in sections of tissue of sclerosis that the lymph spaces are all very wide. Whether that is really due to pressure, to an edema, or whether to a certain extent they are due to artefacts, I am not in a position to say. Writers have called attention to the fact that it is possibly due to localized changes which are not permanent.

In regard to Dr. Wile's question, I may say that the fat is collected in the cells and as far as I could make out most of these cells were the scavenger neuroglia. Besides these cells there were numerous epithelial cells which did not contain fat. It seems to be rather difficult where the cells are filled with fat as these were, to tell what the nature of the cells is, but comparing these sections with other sections not treated with the Herxheimer stain, it appears that they are probably the neuroglia scavenger cells. In all probability the collection of fat comes from the breaking down of the myelin sheaths and the degeneration of the nerve fibers themselves.

Attention has been repeatedly called to the association of tuberculosis with multiple sclerosis. Many cases have shown clinically lesions of the lungs. It would be very interesting to follow this up in all the cases. The reason that we are obliged to study chronic conditions, or the terminal stage of the disease is because the patients do not die early from multiple sclerosis. Therefore it is very difficult to study the beginning of the disease, or the condition in acute stages. There are very few cases where this is possible.

SOME REMARKS AND CLINICAL REPORTS ON THE USE OF DAKIN'S SOLUTION.

C. B. G. DE NANCREDE, M.D.
AND
R. W. KRAFT, M.D.
(From the Surgical Clinic, University Hospital, Ann Arbor, Michigan)

At the request of your President, I have consented to make a few remarks concerning an alleged new remedy for infected wounds, which is claimed to produce results not much short of marvellous. Fortunately we have but few cases where, asepsis going astray, or because of the necessity of invading tissues recently the habitat of pyogenic organisms, inhibitory influences being removed from the microbes, profuse suppuration occurs. Dr. Kraft has kindly supplied me with brief notes of the few cases where we have had a chance to try this much vaunted remedy.

But first a few words must be devoted to an attempt to disentangle fact from fancy, concerning this Carrel-Dakin solution as it is most commonly termed. I say an attempt, because I am far from certain that the abstracts from which I draw my information are correct. Certainly the percentages of the hypochlorous acid, and some other ingredients markedly differ, yet I do not regard these discrepancies as of serious moment.

Hypochlorous acid is said to have been first discovered by Berthollet in 1788, but Ballard in 1834 seems to have later shown that Berthollet's fluid really consisted of sodium chloride and sodium hypochlorite. Perry by passing chlorine into crude potashes in 1792 secured a disinfecting fluid called *Eae de Javal,* because made at the Javel works near Paris, really a solution probably of impure sodium hypochlorites. The French pharmacist, Labarraque by passing chlorine through an aqueous solution of sodium carbonate, obtained a fluid containing much free alkali, hence irritating. Later, by other processes, a more stable preparation than the hypochlorites of sodium and potassium was secured and is what is probably usually termed Labarraque's solution, viz., one of calcium chloride and calcium hypochlorite. This is the preparation by means of which Semmelweiss in 1846 eradicated puerperal fever from his clinic. In addition to these brief statements, let me add that several elaborate methods have been described for preparing this Carrel-Dakin solution, but all non-essentials being neglected, such as salts of boracic acid, the active agent is from 2-3.5 per cent. of hypochlorous acid. The formula we have employed is as follows: Dissolve grams 12.5 grains chlorinated lime in 1000 cubic centimeters of water, after which 12.5 grams of acid boricum is added; then leave this standing for twenty-four hours, filter and use.

The use of Labarraque's original solution for sloughing carcinomata was taught me nearly fifty years ago, but I have only of late employed anything of this kind for recent infected wounds.

I would premise Dr. Kraft's brief notes of the few cases in which this remedy has been employed by saying that the alkalinity of true Labarraque's solution, which is decidedly irritating, is removed by the addition of the boric acid, which in itself is probably of little value. Some of the benefit in unhealthy wounds is believed by certain of the Continental surgeons to be due to the increased vascularity resulting from the mildly irritant effects of the application, and not to the germicidal effects of the hypochlorous acid. Indeed some recent reports claim that the wound fluids thus treated provide a favorable culture medium for germs.

I am reasonably satisfied that for a time nothing but good results, but believe that the granulations tend to become pale and avascular. As is to be expected, the odor is improved, and in the seriously infected sloughing wounds which as a rule follow shell wounds, I should expect exceptionally good results. It cannot be ignored, however, that free drainage, mechanical removal of hopelessly damaged tissues, and the statement that free "debridement" is commonly employed, must be given due weight in considering the results. Per contra, even the following cutting makes us sceptical concerning many statements coming from abroad through the medical press. So many conflicting statements, which are often diametrically opposed reach us, that we cannot but demand time to correct such apparently ill-founded claims as every new periodical brings.

Dr. Tuffier at a recent meeting of the *Societé de Chirurgie de Paris,* advised the systematic introduction into seton wounds of a gauze drain for irrigation and disinfection by Dakin's fluid. Dr. Broca showed, by personal statistics, that more than three-fourths of these seton wounds healed without other treatment than application of aseptic dressings at the orifices.

Continual irrigation with Dakin's fluid, therefore, has no advantage in such cases; on the contrary, it has disadvantages, for in seton wounds which contain debris of clothing, with or without bone fragments, Tuffier himself admits that irrigation with Dakin's fluid is in-

efficacious. In these cases the only course to pursue is to open up freely on the appearance of the first signs of inflammation.

I think that I have never seen under the free use of boracic acid solution, the rapidity with which the pus is diminished, with the Dakin's solution. I think we have long since found out by laboratory experiments, and clinical experience that boracic acid is practically not much better than salt solution. As to the hyper- or hypo-tonicity, I know nothing. This has never been mentioned in the accounts I have read. Some of the solutions are 3½ per cent.. some 2 per cent., and some I don't know what per cent. I must say that I think this solution has a marked effect in diminishing pus and odor. All of these reports of the wonderful effect in wounds, as I have said, were for seriously lacerated, infected wounds, with advanced mixed infections. These were freely laid open to get perfect exposure, and the scissors and knife were used to trim away hopelessly damaged tissues. The deepest portions were drained by tube in most cases, and then light packing with gauze, soaked in this solution was placed, and maintained in contact with the surfaces.

Here in the quotation of the two Parisian surgeons, note that one claims that gauze soaked with this solution, should be passed even through seton wounds, and the other says that you need only put on an aseptic dressing at the exit and entrance wounds and that three-fourths will get well equally certainly without complications, in other words, the uninfected wounds. On the other hand, as Broca shows, more harm than good follows the more radical practice really indicated only for the seriously infected ones. There can be no one method of treating every war injury.

In the few case-notes with which Dr. Kraft has supplied me, it cannot fail to be recognized that not one was a sloughing wound with large masses of devitalized tissue, and fragments of infected clothing, soft parts, or some foreign body. Therefore, the results I shall mention, in no wise prove that with the worst conditions presented, even the moderate improvements that I have secured, would have been noticed.

I am personally very skeptical as to the part played by chemicals in wound treatment, but it does seem to me from what I have personally seen of shell wounds, and because for the first twenty-five years of my practice I never saw even an operation wound heal without suppuration, I must concede that this solution has some effect. It is not irritating. I have very grave doubts whether the major part of the improvement is not due to the free exposure of the damaged surfaces required by the method of applying the remedy advised by most, which provides the freest exit for discharges and damaged tissues. Thus in infected wounds with much destruction of tissue, I again repeat that the results secured must be very largely due to the free drainage, and the ready exit for dying tissues.

None of the cases which I shall mention, were in any sense similar to those resulting from extensive shell and bullet wounds, with the worst results of marked infection. Because some benefit accrued from our treatment of these comparatively trivial injuries, there is no proof that the marked effects claimed in the worst class of cases is to any extent proved.

CASE 1. C. T. age 3, explored for needle in knee by Dr. Darling.. A stitch abscess occurred at the upper angle of the wound. Temperature 102.4°, due as was shown to staphylococcus infection. Sutures were removed and the wound irrigated for seven days with Dakin's solution, no drainage. Healed at the end of ten days, the pus markedly lessening after the first treatment. Very little scar formation. Knee joint normal.

CASE 2. Mr. C. D. age 37. Operated by Dr. Barss. Twelve hours following operation for inguinal hernia the temperature reached 103° and the white cell count 29,000. A large swelling formed on the second day in the flank, and on aspiration a large amount of serosanguineous fluid, showing short chain streptococci was secured. The discharge soon became purulent and very profuse. Leucocyte count 19,500. The patient was very ill. The sutures were removed and a tube introduced on the fifth day. The abscess in the flank drained through this, but a counter opening had to be made at the most dependent point on the twentieth day, when Dakin's solution was first used. The tube was out by the thirtieth day, and ten days later the patient was discharged with an entirely healed wound. This infection was a virulent one, the patient being very ill, restless and sleepless. The pus was lessened by one-half after the first irrigation with the solution, but a counter drain was inserted on the same day.

CASE 3. Mrs. B. age 28. Appendix removed during an interval. Twenty-eight hours after the operation the temperature reached 102° leucocyte count was 40,000, reaching 50,000 on the third day with temperature 103°,

pulse 138. The seventh day, the temperature was 104.9°. On the twelfth day temperature was 104.9°, pulse 120. On the sixth day three stitches were removed, and the next day a tube drain was introduced, and another tube on the twelfth day. Irrigation was started on the seventh day, when the discharge immediately became slight, and in ten days after the institution of treatment, the white cell count dropped from 50,000 to 9,500. On the twenty-sixth day the patient was discharged with the wound entirely healed. Her temperature had dropped from 104.8° to 98.6° by the third day after the use of Dakin's solution. The apparent cause of the trouble was a very marked erysipellatous lymphangitis of the right mammary gland, and axillary lymph nodes which was evidently bloodborne.. The only portion of the wound which was infected was the subcutaneous fat which was very thick. It was believed also to be bloodborne infection as there was no spread of the breast infection to the abdominal incision by continuity.

CASE 4. M. G. age 19, amputation at hip joint for sarcoma of the femur for which a conservative operation had been done two months before by Dr. Darling.. Consequently, from this considerable lingering infection in the bone and soft parts of the thigh occurred, which apparently cleared up before the patient came under my care. Operating thus, in tissues previously infected, a tube drain of large size was of necessity employed, and on the eighth day, the discharge became not only free, but purulent. Irrigation through the tube, and dressings of the wound with the Dakin solution, seemed to very promptly diminish the discharge, and improved its character, but it was still markedly purulent, although steadily diminishing. On the thirty-third day after operation, the patient was sitting up in a wheel chair, and was sent home on the fifty-eighth day.

CASE 5. Mr. McA. 52 years of age, had had for years recurring suppuration of the soft parts of the thigh the results of extensive disease of the knee joint. While it seemed as if the flaps had been cut well above the old suppurating areas, within forty-eight hours he had a high temperature, pulse, and profuse suppuration. This became markedly diminished with the use of Dakin's solution, despite the fact that implication of both shoulder joints by an embolic process, and other pyemic foci caused his death. The amputation wound was practically healed, although it seemed at the outset to bid fair to remain open for many weeks.

The explanation, except in the last two cases, of the failure of asepsis, is not necessary to discuss for our present purposes. I cannot but believe that a decided benefit accrued from this treatment over and above that which we secured by mechanical conditions of the wound by efficient drainage. I cannot but think that if these had been wounds with a severe mixed infection, containing devitalized tissues such as often obtains in war wounds, the results would have been far less satisfactory than in the comparatively trivial conditions presented by the cases.

DISCUSSION.

DR. IRA D. LOREE: Dr. de Nancrède recommended my trying this solution in a case of residual abscess from seepage of urine from a kidney which we had opened. The infection readily cleared up after opening, so we haven't used the solution. Dr. de Nancrède's cases I take it are nearly all acute. I would like to know of what value this would be in chronic cases like some of the cases of appendicitis we used to have. Formerly when we had a case of appendicitis to operate here it was always suppurative. If it was a localized abscess we thought we were unusually lucky. There was usually peritonitis in the early days. Some of these wounds remained open for weeks. Dr. de Nancrède insisted that those cases had to be irrigated twice a day. We had to come over and irrigate them at night. If this is a good thing for chronic suppuration I think we have two or three cases in the Genito-urinary Clinic upon which we can try it. One man I am sure it can not harm, an old man in the 70's who came to the Hospital passing fecal matter per urethram. He had four or five calculi in the bladder which we removed hoping that this drainage might cause the fistula to close. He has a very foul bladder and the wound is suppurating and sloughing and I would like to ask Dr. de Nancrède's advice as to whether we should try some of this solution.

DR. DE NANCREDE: As you have remarked it can do him no harm.

DR. WALTER A. HOYT: I have been very interested in following out some of these cases and especially in the hip joint amputation where we had quite a discharge. The first twenty-four hour dressing was completely saturated through several thicknesses of gauze and pads and external dressings. At that time we put in a tube to drain the discharge but we had it in several days before we tried the solution. Undoubtedly there was a rapid decrease in the amount of discharge. I would say in four or five days at least half the amount, and a rather rapid decrease from then on. In this case in particular before we began using this solution the granulation tissue about the opening was very red and vascular. After using the solution for a short time the granulations seemed to stop their prolific growth and become more or less smooth and pale. It seems to me that in these cases as soon as the discharge has let up to a certain extent it is a good plan to

stop the irrigation because the granulation of tissues comes to a standstill. In all of these cases we used drainage and undoubtedly that is one of the important parts of the treatment. It is not unpleasant to the patient and is not irritating. It doesn't hurt the patient to have the wound irrigated and they don't object to it at all. It seems to me it is a good solution provided there is the proper amount of drainage established early, and I would say that it should be discontinued early rather than carry it through the whole infection.

DR. JAMES A. VAN ZWALUWENBURG: I should like to ask about the tonicity of this solution; is it hypotonic or hypertonic? It occurs to me that both boracic acid and hypochlorous acid are relatively poorly dissociated, and the solution used might be nearly isotonic.

DR. R. U. KRAFT: About a 2 per cent. solution.

DR. VAN ZWALUWENBURG: That is about an isotonic solution.

A CASE OF PSEUDOHYPERTROPHIC MUSCULAR DYSTROPHY

CARL D. CAMP, M.D.

(From the Clinic of Neruology, University Hospital, Ann Arbor, Michigan)

The patient was ten years old and was brought to the Hospital on account of inability to walk. The case presents some unsual features: First, there is no family history of the disease. The father and mother were both well and the Wassermann reaction was negative on the blood of each of them. The patient had no brothers or sisters living. One was killed accidentally but had shown no similar disability and there was no history of the trouble in grandparents, uncles or aunts. The patient's history was obtained from the parents. He weighed twelve pounds when born but "cried continually" for the first two years. He had no jaundice, no skin eruption and no convulsions. He walked at one and a half years and talked when one year old. His mental development appeared to be normal. He walked fairly well until six years old, but at all times his body would sway in walking and he never could run. He began to go to school but had to stop on account of the difficulty in walking. From the time he was six years old his difficulty in walking gradually increased until he reached his present condition of absolute inability to stand or walk, which was three months before he was brought to the Hospital. There was no pain at any time.

Examination of the patient showed a normal mentality for his age. He was unable to stand or walk. There was no adenopathy. The spine showed a slight lumbar lordosis. The pupils were equal, and reacted to light and in accommodation. There was no extraocular palsy. There was no paralysis of the face or tongue. There was no definite nor localized paralysis in the upper or lower extremities. There was marked weakness, however, in the movements of the shoulder and in the legs. There was marked atrophy of the shoulder girdle muscles and also of the arms but no atrophy of the forearm or hand. The thighs were small and appeared especially so in contrast with the large, hypertrophied calf muscles on both sides. The weakness in the erector spinae muscles is shown by a sitting position. The tendon reflexes in the upper extremities were present. The knee reflexes were not obtained but the Achilles jerks were present. Sensations to touch and to pinpoint were normal in all the extremities. The ocular fundi were examined by Dr. Parker and reported normal. Special note was made of certain of the so-called stigmata of hereditary syphilis. The patient has marked scaphoid scapulae; the bridge of the nose is very wide and somewhat depressed; there is a Mongoloid flap at the inner canthus on both eyes; and the superficial veins in the temporal region and in the head are very well seen. The patient has only four of his second set of teeth; these are the lower incisors and are notched. There is no atrophy of the thyroid gland. The points of special interest about the case, in addition to the negative family history, are: the advanced stage of the disease, a history of some peculiarity in gait ever since birth, and, finally, the presence of some of the stigmata, so called, of hereditary lues, although the Wassermann reactions on his blood and spinal fluid were negative.

In 1913 I published a paper on hereditary degeneration (*American Journal of the Medical Sciences,* 1913) and my conclusion in this paper was that in these cases we were dealing not with a hereditary characteristic which could be transmitted as a unit character in the Mendelian sense, but that we were dealing with some factor such as a toxin which caused degenerative changes in various tissues, sometimes in muscles, sometimes in bones, sometimes in the central nervous system.. This degenerative factor is transmitted and then causes similar degenerative changes in the offspring, and that it is a degenerative factor which is transmitted is shown by the fact that we do not get degeneration which is exactly alike but is of one kind in one parent and of another type in the child.

A CASE OF LEUKEMIA WITHOUT HYPERLEUCOCYTOSIS.

QUINTER O. GILBERT, M.D.
(From the Clinic of Internal Medicine, University Hospital, Ann Arbor, Michigan)

In certain respects the present classification of leukemia is unsatisfactory. While the chronic lymphatic and chronic myelogenous types represent fairly characteristic diseases, relatively little is known of the acute forms and of those forms in which changes of a leukemic character are present in the blood forming organs, without the characteristic blood changes of leukemia. It is known that these unusual conditions can occur in the usual forms of leukemia as a result of treatment by Roentgen rays or by benzol and that they may develop spontaneously in such patients or after infections such as tuberculosis, pneumonia and syphilis. It seems likely, however, that in certain cases the leucocyte blood count remains low despite the presence of typical leukemic changes in the blood forming organs.

In most of such cases, however, the nature of the disease is still evident from the changes in the differential count of the white cells, and the diagnosis can often be made from the blood alone despite the lack of a marked increase in the number of the leucocytes. The observations on the following case are reported with the view of contributing to the knowledge of these unusual cases.

A young man, age 18, a resident of Michigan, entered the Medical Clinic on February 4, 1916. The chief complaint was weakness and pallor. The family history was unimportant. As a child the patient had had measles, chickenpox and whooping cough without complications. There was a definite history of frequent attacks of tonsillitis and quinsy. About one year ago he had an attack called mumps. He has not been well since. During March and April, 1915, there were several attacks characterized by redness and tenderness of the joints with migration from one joint to another. . These attacks usually lasted a few days only and at different times all extremities were involved. The last of these attacks was in January, 1916. He gave up work in July, 1915. At that time he had a confining illness of three weeks with fever and severe night sweats. Following this sickness he was weak and pale and has not improved since. In November, 1915, the tonsils were lanced during an acute attack. For the last two months there has been some edema of the feet and ankles. There has been no definite history of hemorrhage. The loss of weight has been about ten pounds.

Examination.—On entrance the temperature, pulse and respirations were 103-100-22.. The patient is of fair size for his age. There is the general appearance of emaciation with subcutaneous edema. There is a marked pallor of the skin and mucous membrane. The face appears bloated. There is no edema of the ankles. Pupils and movements of the eyes are normal. There is a diffuse alopecia of the scalp. Pubic and axillary hairs are rather undeveloped. The lips are dry and cracked. There is a slight pyorrhea. The tongue has a heavy brownish coat and there is a petechial rash of the hard palate and exudates over the anterior pillars, pharynx and uvula. The tonsils are much enlarged and show scars of operative trauma. The glands of the anterior and cervical triangles are definitely palpable. The left posterior auricular and the suboccipital glands are palpable. The epitrochlears and axillary glands are about the size of small peas. The thyroid is slightly enlarged. Just above the umbilicus there is a small subcutaneous nodule. The examination of the lungs is negative. The heart has an increased rate and a faint, not transmitted, systolic murmur. The abdomen is not distended although there is marked tympany throughout. The spleen is palpable three finger breadths below the rib margin. The liver is not palpable. There are a few purpuric spots on the right side of the neck and legs and evidence of fading spots elsewhere.

The X-ray examination of the chest by Dr. Van Zwaluwenburg is negative except for evidence of slight passive congestion. The stools, sputum, blood pressure and Wassermann were negative. The patient remained in the Hospital for eight days. During that time there was a constant irregular fever ranging between 90 and 104° with a corresponding acceleration of the pulse. The patient during this stay became progressively weaker. He lost eight pounds in weight and showed an increase of the fever. During the last few days there was a definite tendency to hemorrhage about the lips.

The blood showed the most marked and interesting changes.. Enumeration of the blood cells were as follows:

	R. B. C.	W. B. C.	Hemoglobin (Helliges)
2-4-16	2,140,000	9,850	33%
2-9-16	1,590,000	10,700	27%
2-12-16	1,140,000	3,600	25%

The differential count of the white blood cells was as follows:

	N. poly.	Eos. poly.	L. L.	S. L.	Tra.	L. M.	Mast	Myelocytes	Normoblasts	Megaloblasts	Deg.
2-4-16	9.2%	0	72%	8.8%	0.4%	9.2%	0.4%	2	1	4	66
2-9-16	8.6%	0.6%	69%	15.2%	0	7.0%	0.6%	1	1	0	33
2-12-16	9.5%	0	62.5%	22.5%	1.5%	4.0%	0	2	1	1	12

The marked thing about the total counts is the rapidly progressive anemia. The differential count shows an increased percentage of the lymphocytic cells and an absolute decrease in the polymorphonuclear neutrophiles and eosinophiles. The platelets were almost entirely absent from all smears. The cells classed as lymphocytes were abnormal in several respects. They were mostly large cells equal to or larger than polymorphonuclears. The nucleus occupied practically the entire cell. In fact some of the cells showed but very little of a cytoplasm border. In addition the entire cell substance showed more than the normal affinity for the basic stains. But the striking observation was the very large proportion of these cells which showed stages of fission not only of the nucleus but of the entire cell. In the division cells observed in this patient, however, the divisions were evidently amitotic in character.

Dividing cells in the peripheral blood are rare and are usually due to mitotic divisions. These occur especially in megaloblasts and myelocytes.

Normal lymphocytes usually show a definite achromatic ring around the nucleus when stained with Wright's stain. Most of the cells of this patient did not show this characteristic. Except by the comparison of the staining reactions of other stains especially the Ehrlich-Pappenheim triacid, one could not always be sure whether the small cells conformed to the usual description of normal small lymphocytes. For this reason all the cells classed as large and small lymphocytes should really be classed as one group. The mononuclear cells in this blood did not give the oxydase reaction of Schultze, neither did they show the premature granules of myeloblasts nor any transitional forms from myeloblasts to myelocytes. This is evidence that they are not of myeloid origin. The polymorphonuclear cells stained poorly. The granules were large and coarse. These cells were definitely deficient in some of the normal staining substances.

The red blood cells showed marked changes in size and shape with a very definite tendency to the microcytic types. The cells showed the usual staining reactions present in severe secondary anemias. It was difficult to recognize the few nucleated red forms when stained with Wright's stain as the cytoplasm as well as the nucleus took the basic stain and the resemblance to small lymphocytes was marked. However, with the triacid stain these cells were very distinctly differentiated by reason of the dark bluish-green nucleus and reddish blue cytoplasm while the lymphocyte nucleus is usually stained with lighter shades of green, and the cytoplasm a pale homogeneous pink.

The bleeding time as determined by Duke's method was definitely lengthened, probably on account of the marked decrease of platelets.

A gland about the size of a lima bean was removed from the occipital region by Dr. Hoyt, and Dr. Warthin's pathologic report is as follows: "Lymphocytoma, infiltrating the capsule of the gland and surrounding tissues. Either an aleukemic lymphocytoma or a lymphosarcoma of the generalized variety." Many of the gland tumor cells are not unlike the cells found in the peripheral blood except that they are smaller due in part to contraction of the fixing fluids.

A number of similar atypical cases have been reported in the literature. Since they are not well understood, a variety of names have been suggested for them such as leukemia, aleukemic leukemia and mixed leukemias and aplastic leukemia.

Many of the cells of this case might well be classed as tumor cells, because of the general type of reversion to a younger type of cell, because of an unusual cell activity as shown by the division forms and because of some evidence

of possible origin in glands having the characteristics of malignant tumors. The cell division forms may be considered as evidence of a very unusual cell activity.

At present the difficulty in this type of case is that we do not know the true pathologic nature and etiology. On the one hand they are described from the pathologic view point as true tumors, lymphoblastomata, with the lymphoblast as the parent cell. While on the other hand many of these cases, especially the acute forms in young individuals give a clinical history suggesting infections, and various organisms have been isolated from such patients.

This patient presents both sides of this disputed point. He has a clinical history of an unproved acute infection while he has evidence of a disease distinctly lymphoblastic in nature with the abnormal glands, gland cells and cells in the peripheral blood which might well be interpreted as neoplasm cells.

DISCUSSION.

DR. HARRY B. SCHMIDT: Dr. Gilbert has covered the ground very thoroughly. I should like to call attention to what he has already stated, that Dr. Dock has definitely shown that in cases with true lymphatic leukemia during an intercurrent infection, the cells can drop down to normal or below normal. I think we might drop the name of aleukemic leukemia and call them cases of leukemia with an intercurrent infection. When one finds an infection producing a blood picture of leukemia, one can usually tell the difference from leukemia. Dr. Cabot reported a number of cases a few years ago of white counts over a hundred thousand. Every one of these cases that showed these lymphatic variations in infections are not leukemias, and always have the small lymphocytes increased and not the large ones. Whereas in leukemia it is the large ones, or both. I saw a case of suppurative peritonitis in Dr. Peterson's clinic, with a white count of over 75,000 with an increase of myelocytes. We have had many such cases with nothing but neutrophilic myelocytes. At autopsy they always find some cause for it, such as a tumor in the bone marrow or miliary tuberculosis.

DR. MARK MARSHALL: I am very much interested in the abnormal types of cells which Dr. Gilbert has just drawn showing the active division forms suggesting the tumor-like nature of the process. I think there is no doubt but that the chronic leukemias are tumor-like processes. However, the acute leukemias such as have been reported are for the most part severe infections. I cannot agree with Dr. Schmidt that one can always differentiate between an acute infection and true leukemia. There have been cases of infection reported in which 85 per cent. of the white cells were myeloblasts. The standard for the differentiation between a simple infectious leucocytosis and a leukemia as set by Hertz and other authorities does not enable one to make a correct distinction in all cases. This was first shown by Ruth in his report of a case of miliary tuberculosis presenting the blood picture of a myeloblastic leukemia.

DR. GILBERT: There is one thing peculiar about these cases of apparent leukemia that occur with definite infections. In the ordinary type of reaction when there is an infection associated with a leukemia there is a drop in white count to about the normal number. In the case that Dr. Marshall reported and another case which we have now under study both of which had miliary tuberculosis, there is an increase in the white count up to 100,000. It may be that these cases are of two types, first those with the blood changes due to stimulation of the blood forming organs from infection without true leukemic changes, and the other type one with true leukemic changes with an abnormal reaction in cell production.

One of the interesting features of this case is the type of cell division because some years ago I was interested in studying the amitotic cell division in healthy regenerating tissue and I have been waiting a long time to find a frank pathologic case where the cells are multiplying as rapidly as they apparently are in this case. This seems to confirm some of my original observations that this kind of division occurs in very rapidly dividing cells, and may be only a modified form of the indirect or mitotic cell division.

Endorse the Council on Pharmacy and Chemistry.—The following resolution was presented at the San Francisco meeting of the A.M.A. and signed by all the members of the house of delegates in attendance: "Resolved, We, Members of the House of Delegates of the American Medical Association, believe that every effort must be made to do away with the evils which result from the exploitation of the sick for the sake of gain. Earnestly believing that the continued toleration of secret, semi-secret, unscientific or untruthfully advertised proprietary medicines is an evil that is inimical to medical progress and to the best interest of the public, we declare ourselves in sympathy with, endorse and by our best efforts will further the work which has been and is being done by the Council on Pharmacy and Chemistry of the American Medical Association in the attempt to eliminate this evil" (*Jour. A.M.A.*, March 18, 1916, p. 910).

The Requirements of the Council on Pharmacy and Chemistry.—New and Nonofficial Remedies contains the rules which govern the Council on the admission of remedies to this book. These rules merely require that the composition of a remedy be non-secret, that its uniformity be safeguarded, that no false claims be made regarding its therapeutic properties and that its use shall be at least based on a probability of therapeutic merit. A simple way of determining if a certain preparation complies with the Council's rules, is to see if it is described in New and Nonofficial Remedies (*Jour. A.M.A.*, March 18, 1916, p. 913).

The Journal
OF THE
Michigan State Medical Society
ISSUED MONTHLY UNDER THE DIRECTION OF THE COUNCIL

Arthur M. Hume, Chairman .....Owosso.
Guy L. Kiefer .....Detroit.
W. J. Kay .....Lapeer.
W. J. DuBois .....Grand Rapids.

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The Society does not hold itself responsible for opinions expressed in original papers, discussions, communications, or advertisements.

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June

Editorials

FIFTY-FIRST ANNUAL MEETING, HOUGHTON, AUGUST 15, 16, 17. HOTELS.

The following are the hotel accommodations that are available:

Douglas	90,	Houghton	$2.50 upwards.
Dee Hotel	25,	Houghton	$1.00 upwards.
Knauf Hotel..	10,	Houghton	$1.00 upwards.
Scott	75,	Hancock	$2.00 upwards.
Northwestern..	43,	Hancock	$1.00 upwards.
Arlington	30,	Calumet	$1.00 upwards.
Calumet	35,	Calumet	$2.00 upwards.
Central	56,	Calumet	$1.00 upwards.

The hotel accommodations will be provided by the three cities, Houghton, Hancock and Calumet. A five minute street car ride or a ten minute walk brings one in Hancock. Calumet is but twelve miles distant from Houghton with half-hourly car service. In addition the local committee has provided for a number of rooms in private homes. Members desiring such rooms may make reservations by writing to Dr. S. Levine, Secretary of the Committee on Arrangements.

The Committee also advises that the members rely to a certain extent upon Pullman Sleeping Car accommodations. The rate in Parked Pullman Cars is $1.50 per day per berth. In this connection please see the editorial on Special Train. It is urged that members who desire to go by Special Train make their reservation early.

Let this thought be foremost in every member's mind: LACK OF HOTEL OR SLEEPING ACCOMMODATIONS NEED NOT DETER YOU FROM ATTENDING THIS MEETING. Knowing the hospitality that characterizes the profession of the Upper Peninsula we are willing to guarantee that every member who attends will be amply provided for, even if the hosts have to forfeit their own beds. Do not for a moment presume that your physical wants will go unprovided.

From the information that we have and which will be imparted in our next issue we are certain that this meeting promises to reward every member that goes to Houghton. The attendance should not be less than 500. You owe it to yourself, your society and your hosts to plan now to attend this meeting and let nothing interfere with your doing so.

ARRANGEMENT COMMITTEES OF THE HOUGHTON COUNTY MEDICAL SOCIETY. FIFTY-FIRST ANNUAL MEETING, M.S.M.S.

Executive Committee.—Chairman, Dr. A. F. Fischer; S. Levine, Secretary; N. S. MacDonald, W. K. West, P. D. Bourland, P. D. MacNaughton, J. G. Turner, and G. A. Conrad.

Arrangement Committee.—Dr. N. S. MacDonald, Chairman; W. H. Dodge, W. T. S. Gregg, H. M. Joy, J. Holmes, J. R. W. Kirton, and J. D. MacKinnon.

Reception Committee.—Dr. W. K. West, Chairman; D. E. Godwin, W. H. King, G. W. Orr, W. H. Van Slyke, W. P. Scott, M. D. Roberts, J. Rhines, A. C. Roache, and A. D. Aldrich, P. H. Wilson, and R. A. Woodhull.

Entertainment Committee.—Dr. J. G. Turner, Chairman; J. Abrams, P. D. Bourland, H. D. Cornell, R. E. Edwards, G. E. Gallen, W. H. Hodges, A. LaBine, R. J. Maas, W. A. Manthei, F. E. Marshall, D. K. MacQueen, J. W. Moore, J. B. Quick, G. Rees, J. E. Scallon, D. D. Todd, and A. R. Tucker.

Finance Committee.—Dr. G. A. Conrad, Chairman; E. T. Abrams, A. I. Lawbaugh and A. B. Simonson.

Publicity Committee.—Dr. P. D. MacNaughton, Chairman, R. B. Harkness, and John MacRae.

SPECIAL TRAIN.

The Committee on Transportation after careful investigation have been unable to perfect any satisfactory boat arrangements for the Houghton meeting. Our meeting occurs at the time of heaviest boat traffic and the chartering of a vessel is not only prohibitive but impossible.

The Committee proposes, however, the arranging for a Special Train. This train, composed of standard Pullman Sleepers, to leave Detroit on Monday evening, August 14, at about 8 p. m. reaching Grand Rapids at about midnight, Mackinaw the following morning and Houghton about 3 p. m. of Tuesday the 15th. The cars are then to be parked in a suitable place and will serve as sleeping quarters during the meeting.

This plan will prove to be a most satisfactory one. It provides a delightful means of transportation and will afford suitable sleeping quarters in Houghton. Members may join the party along the route or at Grand Rapids.

To secure such a train one hundred reservations are requisite. To that end the Committee requests that members desirous of going to Houghton via Special Train, immediately write the State Secretary stating the accommodations desired. Reservations must be made before July 15. Write today to insure this means of transportation.

"WHAT IS THERE IN IT FOR ME."

How often have we not heard this question propounded: "What Is There In It For Me?"

Socially, commercially, professionally—when one undertakes to secure enlistments in the support of some worthy civic, communal or scientific movement the moving spirit is too often met with that query. Bearing as it does the ear marks of a selfish, narrow, conniving, calculating, attitude and individualism, it is all too evident in the minds of many; it is the causative factor of failure and stagnation—the effective dampener of enthusiasm and progress. "What am I going to get out of it." We have naught but pity, bordering almost on contempt, for the individual whose foremost thought is so self-centered, so morbid.

Here and there, in our journeys about, seeking to instill, instigate and awaken an individual's realization that he is in duty bound to contribute time, effort and personal activity to re-create organization enthusiasm and life, the first response that is uttered is, as a rule: "What is there in it for me?" We have been forced to the conclusion that therein lies the reason why so many County Societies lack the "pep," exhibit but mediocre talent and fail to have and enjoy a live, flourishing local medical society.

The sooner we realize that such an attitude is but a short step distant from complete oblivion, the sooner will there be witnessed a state wide re-awakening of medical enthusiasm and achievements. This is the day of organized effort, the day of co-operative force and energy. The lonely, self-centered and selfish mortal cannot hope to remain in the fore-rank of progress. Alone, with thoughts centered in self, with no other idea but personal remuneration, thoughtless insofar as his neighbor and fellow is concerned, he trails in the far rear-rank, enshrouded in the dust of the front file's accomplishments and is being blinded by the thought that alone, single handed he is causing the eyes of his community to gaze with admiration upon him. Poor, deluded, ignorant, backsliding, "has-beener" who no longer is even an "is 'er."

To be progressive, to merit confidence, to be successful, to accomplish and be accomplished, to command respect, trust, love and happiness necessity prescribes that our attitude must not be characterized by the receiving posture. Doing, giving, expending time, thought, study and energy—these must be our predominating attributes. It is not the "What am I going to get" but "What can I give" spirit that brings the royal, satisfactory reward. What can I give my society, what can I do for my society, how may I spend my energy and effort for my society—that is the investment that is imperative if one ever hopes to reap dividends. Let well-thinking people once become convinced that we are a selfish, grasping set, and the organization's worthiest claim will be defeated. Substantial reward, though sought indirectly, though but little taken in account, will ordinarily accrue to fidelity and zeal for professional work.

What are *you* going to do and give? What are you willing to expend? How much time, energy, work are *you* willing to invest? Having determined that, then become active and make your deposit with your County Society. Don't wait for a receipt but place the capital so that it will be at once available. Ere you are aware you will be collecting, without thought or worry, the accruing dividends that are guaranteed to result.

Let's forget among Michigan Doctors—"What am I going to get" and concentrate our energy

and thought on "What are we willing and ready to give." By doing so there will be promptly recorded a professional, organization and personal advancement—a new era of prosperity.

THE MORTALITY FROM CANCER.

The most complete statistical study of the above captioned subject is presented in a 826 page book that has been written by Frederick L. Hoffman, Statistician, Prudential Life Insurance Company.

The main results of the investigation may be summed up in the brief prefacing but suggestive statement: That the actual frequency of malignant disease throughout the civilized world has been ascertained to be much more of a menace to the welfare of mankind than has generally been assumed to be the case, and that on contrast to a marked decline in the general death rate, cancer remains one of the few diseases actually and persistently on the increase in practically all of the countries and large cities for which trustworthy data are obtainable.

The work is divided into nine chapters and is replete with tables and charts that graphically present the conclusive results. A large accurate bibliography is incorporated. It is impossible to review in detail the accurate results of this valuable study. We, however, do believe that it is conclusively shown that cancer is more common than has generally been assumed; that the annual mortality throughout the world is 500,000 per annum and 80,000 per annum in the United States alone; that the disease is increasing. This study is going to serve by arousing a universal interest in the problem of cancer control and a development of a public understanding of the necessity of early surgical interference in place of a blind reliance upon more or less disappointing methods of treatment by other means. As such this compilation is a most commendable one and its author merits our most hearty and appreciative approval. We are eager to see it receive the thoughtful study of every physician and surgeon.

Deaths

Dr. Harvey died in his home, Saturday, after a few weeks' illness from paralysis. He was well known in Detroit as a stomach specialist. After graduating from the Detroit College of Medicine, he specialized in a post-graduate course in Berlin, Germany. He was well loved by his patients for his sympathetic and conscientious care and the personal element which he put into his work.

Dr. Harvey was a member of Palestine lodge, F. & A. M., the Detroit Athletic Club, Detroit Boat Club, Wayne County Medical Society and the American Medical Association.

Dr. Wm. Morris, of Gagetown, died May 13th after an illness of only four days. He was a practitioner in this community for thirty-seven years and was very prominent in professional and civic affairs.

Dr. F. Townsend, Sault Ste. Marie, died April 26. He was a well known surgeon of the upper peninsula and has been honored and respected by all in his community.

He had been suffering from pneumonia for ten days and his death was a shock to every one. He was a member of F. A. C. S. and many honors had been conferred upon him during his medical career.

Dr. Albert McMichael, of Detroit, died April 28 in Grace Hospital from diphtheria. He was President of the Board of Education and had been an active physician in the city of Detroit for the past twenty years.

State News Notes

The notice of the removal of the Dextri-Maltose manufacturing plant from Jersey City to Evansville, Ind., published in one of our advertising pages, deserves more than passing attention. It furnishes evidence of the natural growth of a manufacturing enterprise which is now vacating its old factory with 18,000 square feet of floor space for a new location in the Central West and in a new plant with 300,000 square feet of floor space—sixteen times larger than the old one.

This removal from a comparatively small to a very large housing also affords striking proof that success awaits the manufacturer who produecs something the physician really wants, and markets his products in accordance with the standards set up by doctors for the sale of products they use. The first commandment for the direction of the manufacturer under these standards is: "Thou shalt not offer to both physician and public, by advertising or otherwise, anything which requires medical skill to properly use."

This commandment has been ignored by some manufacturers of infant foods, who have persistently educated the public with pseudopediatrics, thereby tending to increase infant mortality and hampering the physician in the practice of scientific, or even rational infant feeding.

But ultimate reform in the manufacture and sale of infant foods was as inevitable as the reform that has taken place in the sale of pharmaceutical products. The day of mystery and tradition in infant feeding is passing rapidly.

The recent simplification of bottle feeding, rendering it possible, without impractical complication, for the family physician to successfully adapt the diet to the individual baby, has brought about a strong con-

viction that the direction of infant feeding is distinctly the proper work of the physician.

This conviction has in turn created a demand for forms of carbohydrate foods which can be freshly prepared in exact proportions to meet clinical indications; and for their sale without directions for use, so that the physician can personally control the administration of the food.

The firm, which announces herewith its removal from the east to larger opportunities in the west, early recognized the requirement by the medical profession for a product used in infant feeding, made and sold exclusively for physicians, with no appeal, nor information to the public.

Ths firm deserves no special commendation for the course it has pursued, it being its duty to follow it. Reference to the sales of Dextri-Maltose is made simply to show that it is remunerative for manufacturers to treat the medical profession fairly.

The Forty-eighth Annual Commencement of the Detroit College of Medicine and Surgery, will be held in the Arcadia Auditorium, Woodward and Stimson Avenues, Thursday, June 8th at 8 o'clock.

The following is the program:

Invocation—Rev. Chester B. Emerson.

Commencement Address—Rev. Frederick Edwards, Dean, St. Pauls Cathedral.

Faculty Address—Doctor Frank B. Walker.

Conferring of Degrees—Mr. Sidney T. Miller, President of the Board of Trustees.

Valedictory—Ray W. Hughes of the Graduating Class.

The Graduating Class consists of forty-nine members, nearly all of whom will receive Hospital appointments or will commence the practice of medicine in connection with men who have an established practice, or opportunities similar in character. One Post-Graduate student is a candidate for the degree of Master of Public Health.

For the first time Detroit pulpits will be filled by physicians on June 11, which is to be known as "Public health" Sunday. The American Medical Association convention will be opened here at that time with a probable attendance of 15,000 people, 8,000 of whom will be doctors and surgeons. The speakers who will occupy the pulpits will be of national reputation and each an authority in his special line. Preventive medicine and public health will be the basis of all the addresses.

The convention will close June 16, with a public health parade and a mass meeting in the Lyceum theater, at which such noted doctors as Surgeon-Gen. Blue of the U. S. army; Surgeon-Gen. Gorgas, of the Panama canal; Dr. W. J. Mayo, of Minnesota, and Dr. Herman Biggs, health commissioner of New York state, will speak.

In a meeting of the board of trustees of the Michigan State Tuberculosis sanitorium, at Howell, and the Central Michigan Tuberculosis sanitorium, in Midland county, of which Dr. Henry J. Hartz, is President, held in Detroit, Thursday, announcement was made of the purchase of forty acres of land near Sanford, in Midland county, adjacent to ten acres contributed to the sanitorium by the county. Dr. Eugene B. Pierce, superintendent of the sanitorium in Howell, stated that a cottage for boy patients would be opened June 1.

About 100 members of the senior class attended the customary final dinner of the Detroit College of Medicine and Surgery in the Hotel Statler. Addresses were given by Dr. F. B. Walker, Dr. F. W. Robbins, Dr. J. B. Kennedy, Dr. Charles G. Jennings and R. G. Tuck, who gave the class history. Dr. Guy L. Kiefer presided.

Dr. A. W. Hewlett, Professor of Internal Medicine, Ann Arbor, has resigned to become Professor of Internal Medicine and Neurology at the Leland Stanford University next fall.

Dr. O. L. LeSeure of Detroit was elected President and Dr. F. C. Warnshuis of Grand Rapids was elected a member of the Executive Committee of the American Association of Railway Chief Surgeons.

The second annual meeting of the Interstate Association of Anesthetists will be held in Louisville, Ky., July 25, 26, 27.

Dr. Nathan Jenks, well-known Detroit physician, with offices at 541 David Whitney building, is seriously ill in Harper hospital.

Dr. F. W. Robbins of Detroit was elected President of the American Urological Association at its annual meeting in April.

If you are wondering why not more news from County Societies, the reason is because a neglect to send in news exists.

The Semi-Annual meeting of the Local Surgeons of the Pere Marquette Railroad Company was held in Grand Rapids May 24.

Dr. R. O. Knapp formerly of Ionia has located at Alden.

Dr. J. V. Frazier of Port Huron has enlisted in the Medical Department of the 213th Canadian Battalion.

Dr. C. M. Williams is pursuing post graduate work at Johns Hopkins. He will return to Alpena about August 1.

Dr. F. J. Welsh of Kalamazoo has been elected President of the local Board of Health.

Dr. Erwin Eveleth and Miss Augusta Wegner of Detroit were married May 7.

Dr. B. H. Alton has located in Saginaw and is associated with Dr. R. O. Fuerbringer.

Dr. Geraldine C. Snow of Ypsilanti has been chosen medical inspector of the Normal School.

Twenty nurses were graduated by the University Hopital, Ann Arbor on May 5th.

Miss Amanda Jones has resigned as Superintendent of the Stearns Hospital, Ludington.

The entire Senior Class of the University have secured interneships in various hospitals.

Dr. R. D. Sleight and Dr. Wilfrid Haughey of Battle Creek have perfected a partnership.

County Society News

LAPEER COUNTY

The regular meeting of the Lapeer County Medical Society was held at the Burleigh Hospital in Almont on Tuesday, May 9, 1916.

The Tri County Society was invited to be present with us and many of their members were present which made a very enjoyable meeting.

Dr. J. H. Carstens of Detroit gave a very interesting talk on Arterio Sclerosis and Diet and Dr. Hitchcock of Detroit read a very instructive paper on Syphilis of the Nervous System.

Dr. W. J. Kay's paper on "The Tuberculosis Patient" made a fine subject for discussion and sure hit the nail on the head for many practical facts regarding the etiology of that disease.

Dinner was served at the Hospital to those who were present at that time and then a nice refreshment was also served during an intermission later on in the afternoon. Great credit is due to the Drs. J. H. and D. H. Burleigh for their earnest endeavor in placing such a modern Hospital at the disposal of the surrounding community.

The next meeting is to be held at Imlay City on June 6 instead of June 13 as the latter date will interfere with Clinic Week.

Many good papers are being arranged for that date and a good attendance is desired.

J. H. DOUGLAS, Secretary.

MUSKEGON-OCEANA COUNTIES

On January 21, Dr. A. M. Campbell of Grand Rapids read a paper and illustrated with stereopticon slides "Surgery of the Knee Joint."

Drs. Chapman and Cooper secured Dr. A. E. Halstead of Chicago for the regular meeting of March 3rd. The subject of this very interesting paper was "Clinical Significance of Intra-Cranial Pressure." This meeting was held at Hotel Hentschel and a banquet followed.

On March 31 the Society enjoyed a banquet in the spacious and elegant new dining room for nurses at Hackley Hospital and Dr. F. C. Warnshuis of Grand Rapids presented his very instructive subject of "One Thousand Consecutive Cases of Industrial work at Hackley Hospital.

The next meeting was held at the usual place, Hackley Public Library, and Dr. Cramer discussed and presented a number of plates of his own X-ray Accidents." This was followed by a general discussion.

The year's program is arranged in alphabethical order and meetings are held every two weeks. At the last meeting Dr. Eames invited the society to visit her newly equipped pathological laboratory in the Landreth block where she demonstrated the method of the Wassermann reaction. Dr. Eastman spoke of the practical application of the Wassermann test and a light lunch followed.

C. J. BLOOM, Secretary.

WAYNE COUNTY

Our library committee seems to be "on the job" all the time. They are certainly to be congratulated on their efforts and successes.

Subscriptions have been received as follows:

A Friend	$ 700
Dr. H. N. Torrey	100
Dr. F. J. Sladen	50
Mrs. Louise Burt	25
A Friend	700
Mr. Robert Oakman	500
Dr. Adlington Newman	100
The Committee	80
Mr. Frank Leland	100
Total	$2,355

There are several other extremely good prospects in view and the committee confidently expect to have $3,500 in the course of the next week. Eventually they hope to have $50,000 and to make our library one of the big medical libraries of the entire country.

The regular annual election was held Monday, May 15, in the Medical Club reception room. In all 159 ballots were cast with the following results:

Dr. J. A. McMillan was elected President, receiving a majority of the ballots, 81 votes being to his credit with 49 to the credit of Dr. Geo. E. McKean and 29 for Dr. Harold Wilson.

For Vice-President Dr. C. D. Brooks received 103 and Dr. B. R. Shurly 52.

For Secretary Dr. Henry R. Carstens polled 112 while Dr. H. K. Shawan received 47.

For Trustee Dr. Angus McLean was elected with 105 ballots; 54 were case for Dr. R. E. Mercer.

Book Reviews

A TEXT-BOOK OF FRACTURE AND DISLOCATIONS, WITH SPECIAL REFERENCE TO THEIR PATHOLOGY, DIAGNOSIS AND TREATMENT. By Kellogg Speed, S.B., M.D., F.A.C.S., Associate in Surgery, Northwestern University Medical School; Associate Surgeon, Mercy Hospital; Attending Surgeon, Cook County and Provident Hospitals, Chicago, Ill. Octavo, 888 pages, with 656 engravings. Cloth, $6.00, net. Lea & Febiger, Publishers, Philadelphia and New York, 1916.

Every form of fracture and dislocation is dealt with most fully in this work, which, because of its completeness and its accurate illustrations, is destined to fill a place of accepted authority in the literature. Unique and important features of the work are the author's method in discussing fractures and dislocations, which are considered together under their several anatomical divisions, and the

special reference and emphasis which are given by the author to pathology, diagnosis and treatment.

A clear conception of osseous injuries and their repair is essential to an understanding of fractures. For this reason the author has selected examples of different types of usual fracture pathology and endeavored to bring them before the reader's eye by means of line drawings, which illustrate the essential points. Every illustration of this character is a careful reproduction of a tracing made from a Roentgenogram of an actual case, for the most part taken from the author's own practice. Much of the clinical and all of the statistical material of this book was obtained at the Cook County Hospital, Chicago.

Physicians called upon to treat cases of fracture or dislocation will find Dr. Speed's book an invaluable aid and guide, for the author's exceptional experience and acknowledged authority give proof of the wisdom and advisability of the measures he advocates.

A MANUAL OF GYNÉCOLOGY AND PELVIC SURGERY. By Roland E. Skeel, A.M., M.S., M.D., Clinical Professor of Gynecology, Western Reserve University. Two hundred eighty-nine illustrations, 680 pages. Cloth, Price $3.00. P. Blakeston's Son & Co., Philadelphia.

This is a manual that furnishes a working knowledge of gynecology with emphasis upon diagnosis and treatment. It should serve, as its title implies, as a satisfactory manual to the student desirous of preparing himself for greater and more extensive reading and research in this particular field. Likewise it will be of inestimable service to the busy practitioner. It contains a large amount of well selected information.

THE CLINICS OF JOHN B. MURPHY, M.D., at Mercy Hospital, Chicago. Volume V Number II (April, 1916). Octavo of 176 pages, 32 illustrations. Philadelphia and London: W. B. Saunders Company, 1916. Published Bi-Monthly. Price per year: Paper, $8.00. Cloth, $12.00.

A MANUAL OF PRACTICAL NURSING, edited by Helen L. Bridge, B.S.R.N. Asst. Superintendent of Nurses, Washington University Training School. 83 pages cloth, C. V. Mosby Company, St. Louis.

Received and pronounced as a valuable manual for nurses.

ELEMENTARY BACTERIOLOGY AND PROTOZO-OLOGY FOR THE USE OF NURSES. Herbert Fox, M.D. Second Edition, Revised, Enlarged. 251 pages, 68 engravings, 5 colored plates. Lea & Febiger.

Miscellany

One swallow doesn't make a summer; and one test doesn't constitute a guarantee of satisfaction. There are always a number of aspects to every article of utility, and although it may measure splendidly up to one of these respects, if it fails in all the rest it cannot be said to be a very efficient article. "Best by every test" is the measure of efficiency. That is the measure by which Calumet Baking Powder excels. Chemically, physically, physiologically, and domestically, it fulfills all the demands of modern science and art. It is chemically correct, physically pure, physiologically wholesome, and domestically efficient and dependable. If you can think of any other quality that ought to characterize a first class baking powder, no doubt the manufacturers will see to that, too. Personally, we can't. It looks to us as if a baking powder that can make good on those four claims is about as nearly perfect as a baking powder can be. However, you know the old proverb—"the proof of the pudding is in the eating of it." Calumet will stand that test, too.

Alarming Symptoms Caused by Diarsenol.—Diarsenol is made by the Synthetic Drug Company of Toronto, Canada. It is stated to be chemically identical with salvarsan. A. H. Cook, Hot Springs, Ark. reports that he has administered fourteen intravenous injection of diarsenol. Eleven consecutive doses were without untoward effect or phenomena differing from those attending the intravenous administration of salvarsan. The three subsequent doses produced alarming symptoms, which Dr. Cook never observed from the use of salvarsan or neosalvarsan (*Jour. A.M.A.*, March 18, 1916, p. 865).

Venarsen, Venomer and Venodine.—The A.M.A. Chemical Laboratory found Venarsen, which is recommended by the manufacturers, the Intravenous Products Company, for the treatment of syphilis, tuberculosis, pellegra and other diseases, to be "a simple solution containing approximately nine grains of sodium cacodylate, 1/40 grain of mercury 'viniodide' and ¾ grain of sodium iodid to each full dose." Sodium cacodylate is inferior to salvarsan or neosalvarsan in the treatment of syphilis. The Council on Pharmacy and Chemistry held the claims made for Venarsen unwarranted and its intravenous injection uncalled for. Venomer, which is also offered as an antisyphilitic remedy, appears to be a variation on Venarsen, containing considerable less sodium cacodylate and considerably more mercury and iodids. It prompts the comment that a careful physician would not give arsenic and mercury in fixed proportions. Venodine was rejected by the Council on Pharmacy and Chemistry because the claims made for it were found unwarranted and its composition unscientific. The indiscriminate use of intravenous products is objectionable for many reasons: It incurs an unnecessary danger, and it puts the physician to needless trouble and the patient to unnecessary expense (*Jour. A.M.A.*, March 25, 1916, p. 978).

DO YOU KNOW THAT

Light promotes cleanliness?

A clean mouth is essential to good health?

Physical training in childhood is the foundation of adult health?

The U. S. Public Health Service issues publications on hygiene and sanitation for free distribution?

Isolation is the most efficient means of controlling leprosy?

Headache is Nature's warning that the human machine is running badly?

Bullets may kill thousands—flies tens of thousands?

Obesity menaces longevity?